Western Industry

January
1957
Vol. XXII No.

1957 Cost Reduction IDEA BOOK

53 selected case histories that show you how to save money, speed up production, or both, under Western plant operating conditions. In 4 sections:

PRODUCTION EQUIPMENT . . p. 34

MATERIALS HANDLING TECHNIQUES . . . p. 74

MAINTENANCE METHODS & PLANT SERVICES . . p. 62

PLANT POWER & MECHANICAL POWER TRANSMISSION . . . p. 46

40 BEST PORTABLE POWER TOOL MANUALS—yours free . . . p. 98

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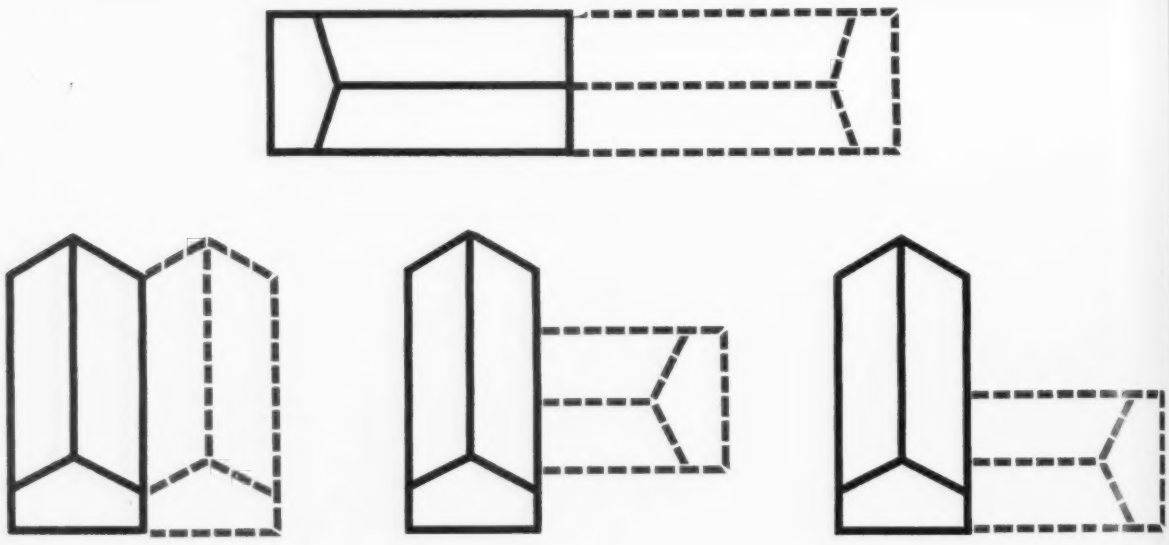

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Western Industry

KING PUBLICATION

January 1957

Vol. XXII, No. 1

1957 COST REDUCTION IDEA-BOOK

75 selected case histories—in 4 sections—that show you how to save money or speed up production under Western plant operating conditions.

SECTION 1 — PRODUCTION EQUIPMENT 34

Welding, portable power tools, machine tools, castings, adhesives, heat treating, degreasing, abrasives, spray painting, etc.

SECTION 2 — POWER & POWER TRANSMISSION 46

Variable speed drives, hydraulic power drives, V-belts, clutches, air power drives, controls, etc.

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SPECIAL — 40 BEST PORTABLE POWER TOOL MANUALS—yours for the asking 98

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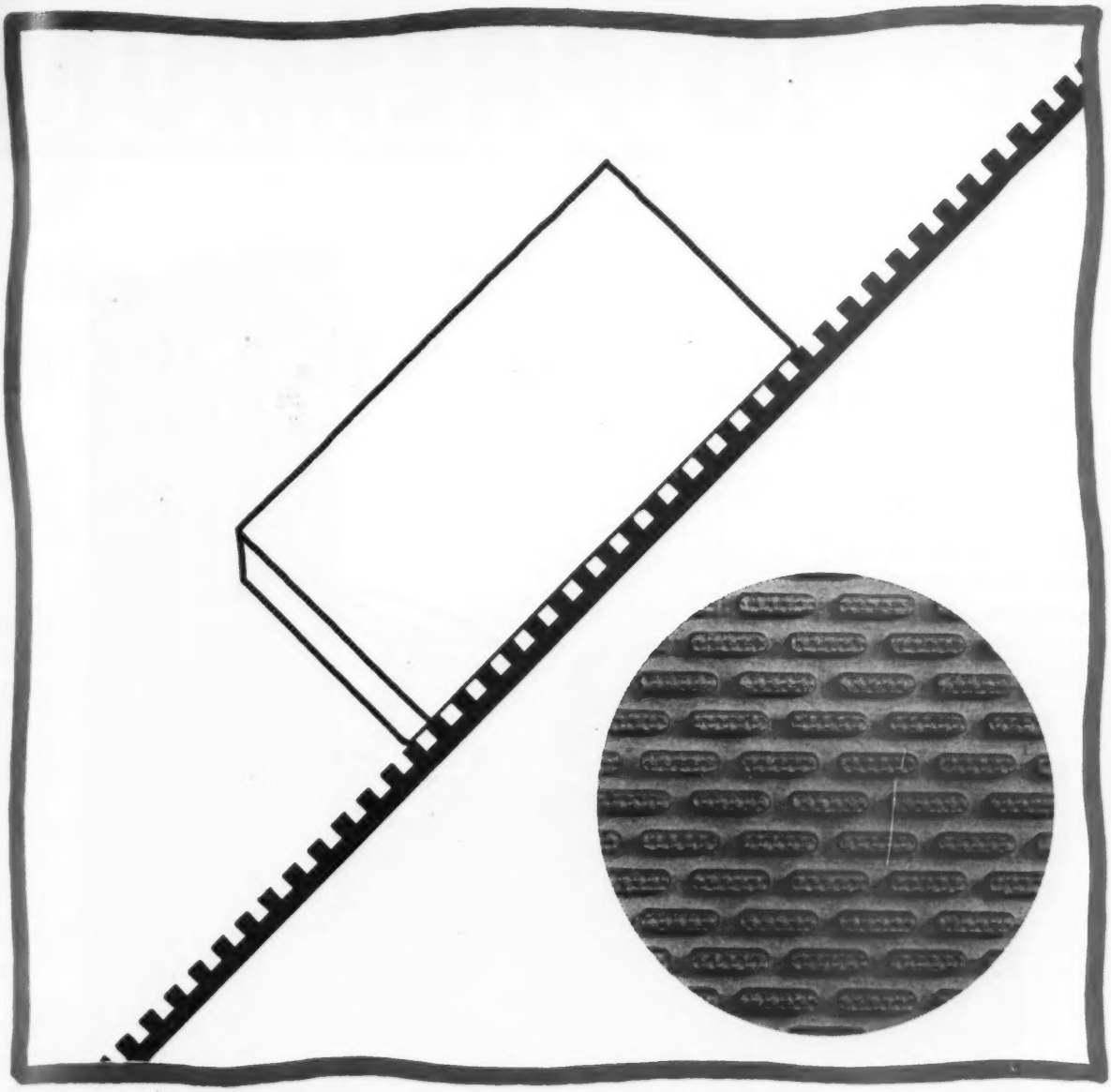
WESTERN INDUSTRY was established in January 1938 as the successor to WESTERN INDUSTRIAL GUIDE. Subsequently, it was published as PACIFIC COAST INDUSTRIAL BUYERS GUIDE, and later, as PACIFIC MACHINERY GUIDE. In October 1940 PACIFIC MACHINERY GUIDE was consolidated with WESTERN INDUSTRY, and both were published under the latter title. In early 1940 PACIFIC MILL, MINE & FACTORY was established, and in October of that year was consolidated with WESTERN INDUSTRY. All rights to the foregoing titles are reserved.



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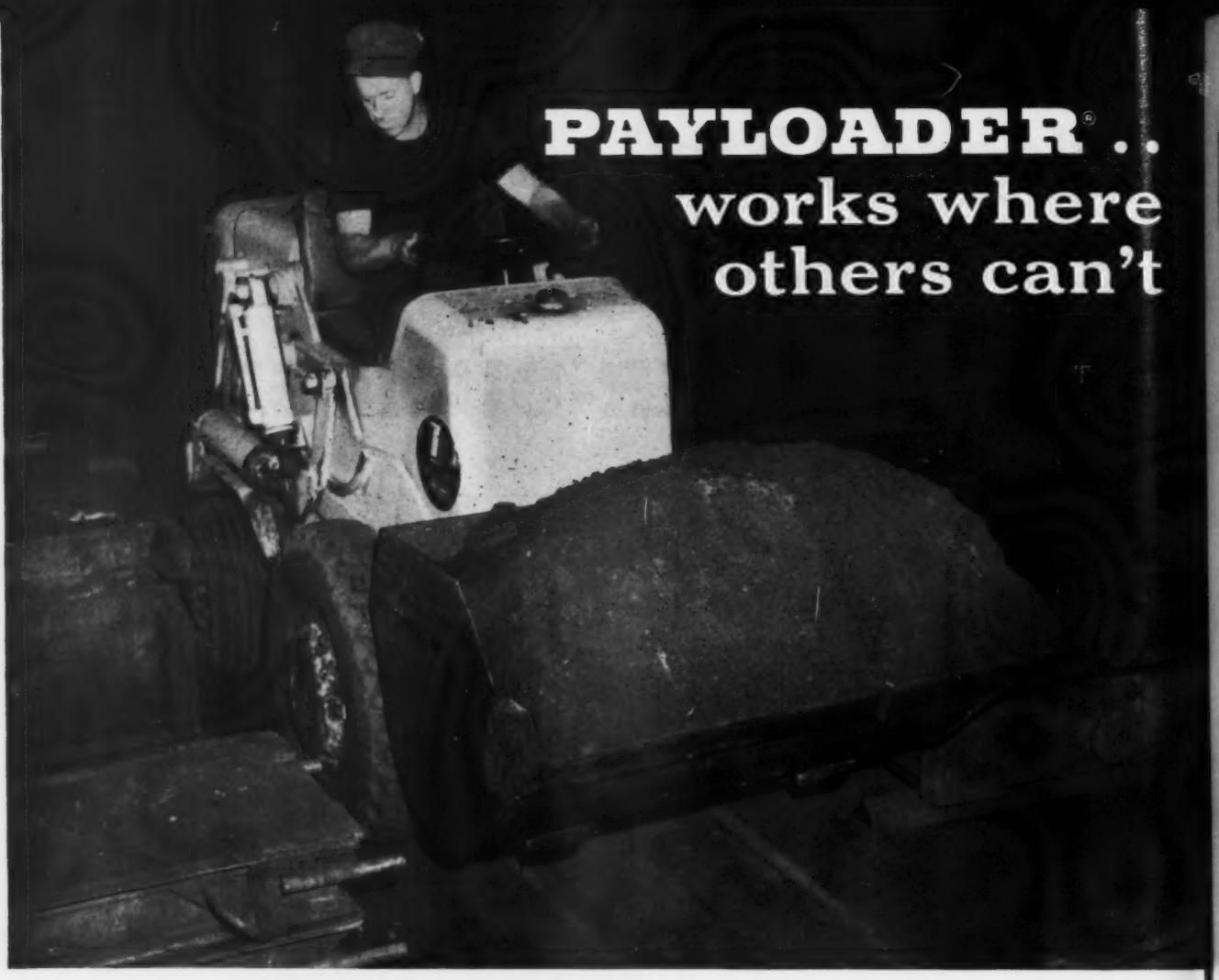

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LETTERS

"PRODUCTION MIDDLEMEN"?

The tremendous new responsibilities being placed upon industrial supervisory personnel today, and the need for all of industry to move quickly toward enhancing the vitality of "production middlemen" in making advanced engineering designs producible in the factory, were forcibly presented by General Joseph T. McNarney, President of San Diego's Convair Division, General Dynamics Corp. before the 3rd annual meeting of The National Management Association . . . with his challenging ideas in turn reviewed in WESTERN INDUSTRY'S *"Views and Comments," November issue. Significant comments from WI readers on General McNarney's ideas are presented below.*—Ed.

"We had better start training them NOW" . . .

EDITOR—General McNarney's remarks are very timely; in fact, none too soon. In order to have this corps of specialists in two to four years, we had better start training them NOW.

Competition makes it necessary to progress as rapidly as possible. I feel these manufacturing technicians would be of great help to our engineering departments, and especially to our production departments.

E. J. CHARTRAND
Industrial Engineer, Kwikset Locks Inc., Anaheim, Calif.

A foundation for progress and profits . . .

EDITOR: Whether or not one agrees with the need of "production middlemen" as presented by General McNarney, the fact is that they are already a reality in progressive companies.

The main problem that arises in companies when such a department is contemplated is whether or not it will be accepted by supervision and be able to start off with the complete backing of management.

A big selling job must be done by management in order that such a group exist. The word "overhead" is foremost in the minds of supervision; and because of this, a new division would certainly be looked at with crit-

. . . continued on page 14

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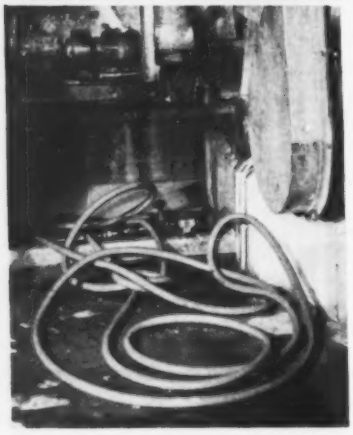

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LETTERS

... continued from page 12

ical eyes. The staff of such a group would be under constant surveillance and must be of high caliber and be able to move through different departments with respect which comes from performance.

General McNarney, in looking to the future, knows the terrific growth that will be made in the years ahead. Greater demands will be made of management. They must be prepared. Plants are turning more and more to automatic methods and processes. The skill required to operate these plants is becoming more and more scientific and information must be procured and evaluated on the latest procedures to keep management abreast of conditions and development.

There are many problems involved in the organization and staffing of industrial or manufacturing engineering divisions. Success at present has come from selecting people from within a company. One must, however, look again into the future and emphasize that our school systems must give a new position to the industrial art subjects in order that we may continue to progress, thus easing the burden of the manufacturing plants in the training of their own personnel.

Companies which act on General McNarney's recommendations, or even a small part thereof, will find the foundation laid in the direction of progress and profits.

LESTER G. HEUSTIS
Chief Industrial Engineer, Hunter Douglas Aluminum Corp., Riverside, Calif.

Pilot runs, and a "de-bugging" period . . .

EDITOR—Gen. McNarney's ideas about "production middlemen" are certainly in general agreement with the thinking here at Tektronix. We have a department set up to handle new products from engineering before getting into regular production.

This "Pre-Production" group rearranges and recommends changes to engineering, from mechanical location to electronic circuitry. Pilot runs are also manufactured in this department to provide further engineering test data. Any modification resulting from the trial run is effected in this department. After this de-bugging period is completed, the instrument goes into full production.

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Industrial Engineer, Tektronix, Inc., Portland, Oregon

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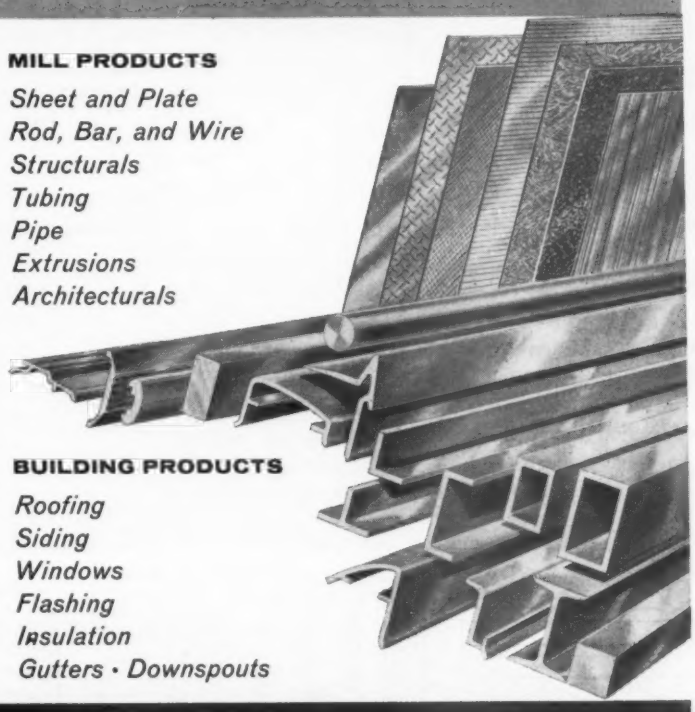

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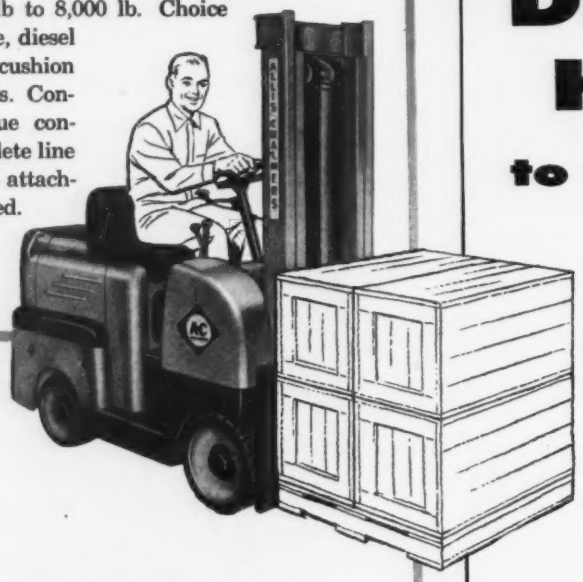

Whether you want to lift material carry it or pull it, here is Allis-Chalmers equipment to do the job with real savings in time and money. Each unit is suited to a specific type of handling. Each is built "from the drawing board up" to deliver top performance.

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for more details, adv. opp. pg., circle No. 12 on Reader Service Postcard

CONVAIR REALLY DID IT!—21,814,875 MANHOURS FREE OF LOST-TIME ACCIDENTS at the San Diego plant, thus crushing all existing safety marks in the aircraft industry. Even more impressive, only one other company in the history of the National Safety Council, regardless of type of industry, has ever achieved so great a total. (E. I. du Pont de Nemours Co. made it over 28,000,000 manhours.)

Daily "no-accident" boards (see picture) scattered throughout the big San Diego plant were a constant reminder to its 35,000 employees of their unparalleled safety achievement as the days and hours mounted. The no-disabling-accident period covered 105 days, ending when two men received injuries as a jet engine starter exploded due to mechanical failure.

An inter-plant safety rivalry developed as Convair-Pomona (guided missile production facility that Convair operates for the U. S. Bureau of Ordnance at Pomona, Calif.) on Oct. 25 passed a full year worked without a lost-time accident, before Convair-San Diego's record period ended early in November. At last reports, Convair-Pomona was past 10,000,000 manhours and still going. Pomona's lower manhour record over the long period of time is attributable to its smaller payroll—less than one seventh the number at Convair-San Diego.

•

"TIME IS MONEY" FOR SMALL PLANT MANAGERS, and you can lose it or save it depending on how wisely you use it. What are the wise ways? Some answers are available, free, from the Small Business Administration, in a just-published leaflet entitled "Surveying and Controlling Executives' Time" (write to the SBA, Lafayette Bldg., Washington, D. C., or contact a local SBA office for your copy.)

The leaflet contains two suggested forms for small plant managers who want to keep a personal "time survey" as the first step in improving planning and control of time expenditures, with suggestions on how to get results from the survey. Three examples are given where managers frequently fall behind in saving money through poor use of time.

One example: "A department chief makes a practice of coming to the head of his company with half-thought-through problems. The top man's salary is $20,000 per year, or $10 per hour. Because the subordinate brings in problems instead of alternate solutions from which the head man could pick the best, there is about two hours of needless discussion each week. Result: In the course of a year the head of the company loses 100 hours, worth $1,000 in salary alone."

We suggest that a personal survey of your time, whether you're the top boss or a first-level superintendent, will show up some surprising "time (money) leaks."

•

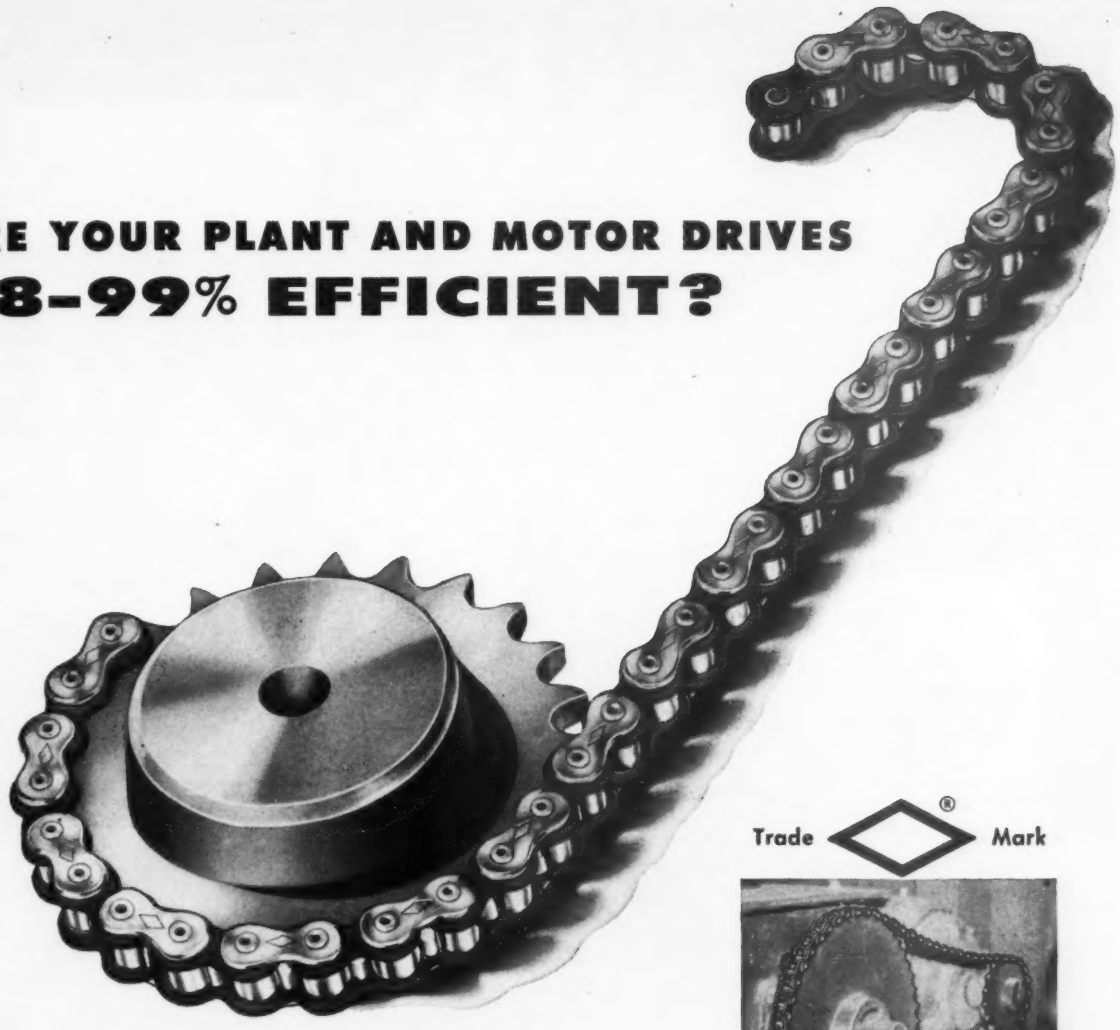
NEW BOOKS TO HELP YOU WITH YOUR LABOR PROBLEMS have become available in abundance during the past two months. Many of those reviewed below are free; all are included here because of their special interest and usefulness to Western plant operating executives.

Earnings and working conditions in the West's electronic equipment industry are reported in a free 32-page booklet (your copy should be requested from the U. S. Dept. of Labor, Bureau of Labor Statistics, 630 Sansome St., Room 802, San Francisco 11—Ask for BLS-SF Regional Report No. 4.) Title of the booklet: "Earnings and Working Conditions in Manufacture of Electronic Testing, Controlling and Analyzing Equipment in Los Angeles-Long Beach, Calif., Area, July 1956." Contained in its pages is an account of the Bureau's first survey in electronics manufacturing, covering everything from wages to provisions for late shift operation.

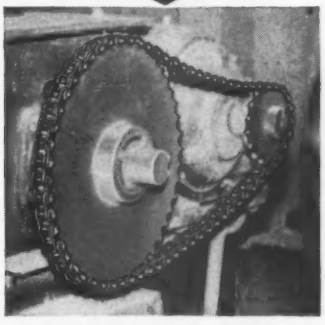
Also available free from the Bureau of Labor Statistics (address same as given in paragraph above) are the following publications: **Effects of Automation on the Occupational Structure,** a 15-page paper dealing with the probable impact and significance of automation on skill demands and training . . . **Characteristics of Major Union Contracts,** a summary of more than 125,000 collective bargaining agreements, giving coverage and duration of major agreements by area and industry . . . **Wage Structure: Machinery Manufacturing, Winter 1955-56,** a 42-page report showing straight-time average hourly earnings, per cent distribution, and related supplementary wage benefits for production workers in 21 selected areas.

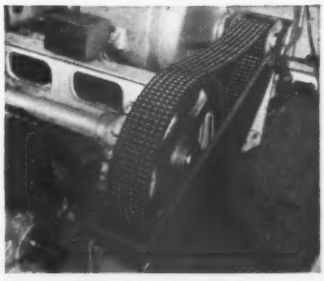
Supervision of Scientific and Engineering Personnel is an 82-page manual compiled by John T. Lloyd and Robert D. Gray and published by the Industrial Relations Section, California Institute of Technology. An outline designed to aid industrial and scientific supervisors, it was derived from a number of conferences and meetings sponsored by the publishers on the subject and from discussions and outlines with and by the leaders of these conferences. Its 11 chapters take the supervisory man from start to finish over each of the problems likely to be encountered in this type of management. The manual is available from the Bookstore at the California Institute of Technology in Pasadent, Calif., at a price of $8.75 for one copy with quantity reductions reducing the cost to $3.50 when 1,000 or more copies are ordered.

ARE YOUR PLANT AND MOTOR DRIVES 98–99% EFFICIENT?



Trade ◇® Mark





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Central Control, Sit-down
Low Headroom Series. Capacities: 2,000, 3,000, 4,000 pounds.

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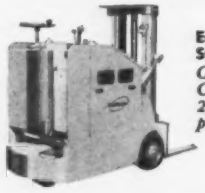
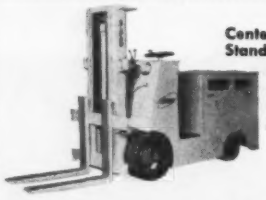


End Control, Stand-up
Cargo Scouts. Capacities: 2,000, 3,000 pounds.



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In several capacities to 10,000 pounds.

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ELPAR trucks are electric-powered to provide quiet, fume-free operation at a cost of only pennies per day. They are built to last; over 90% of those made since 1925 are still in use. As a *no-cost* extra, Elwell-Parker field engineers advise your men on proper preventive servicing . . . a free, personalized service that adds many years of truck life.

Follow the example of 75% of the 100 largest U. S. manufacturers: pick the *right* truck for your material handling . . . choose an ELPAR!

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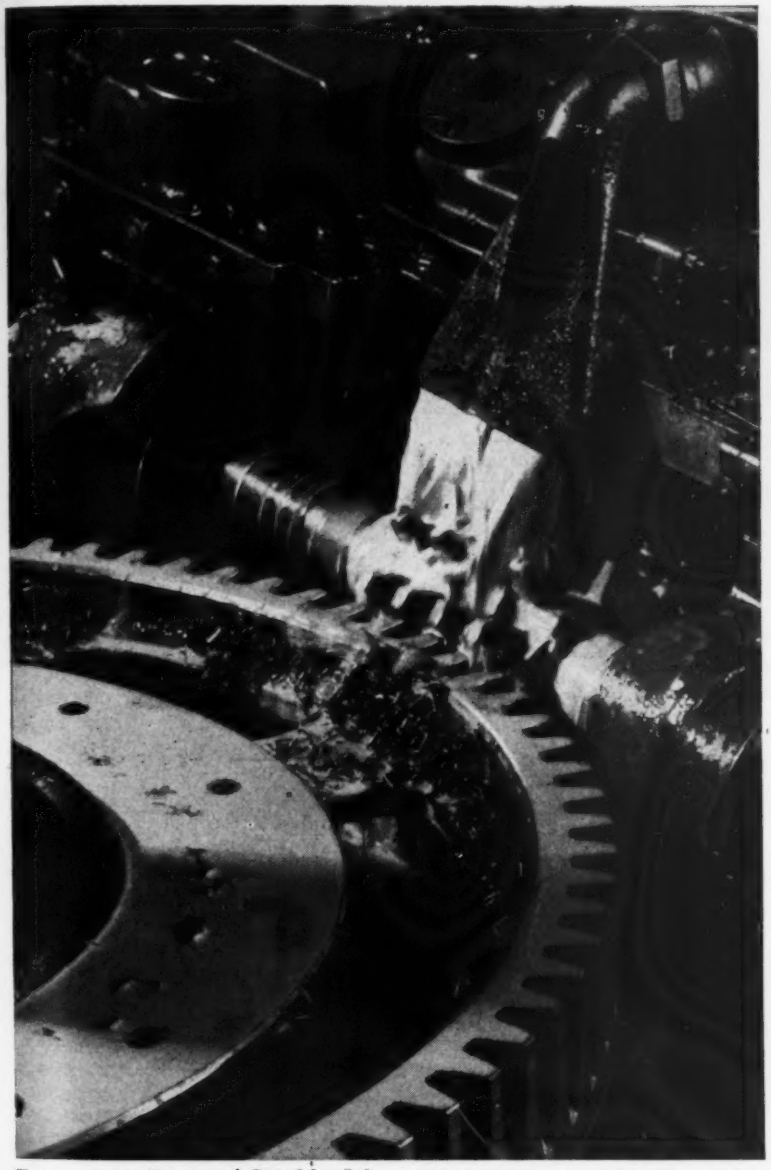
STANDARD ENGINEER'S FIELD REPORT

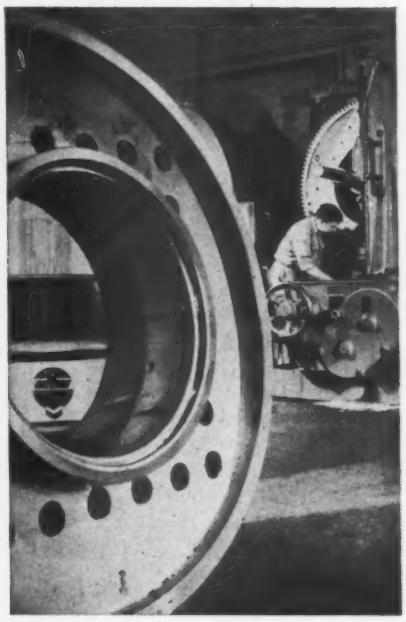
PRODUCT CHEVRON* CUTTING FLUIDS

FIRM SKAGIT STEEL & IRON WORKS
Sedro Woolley, Wash.

Chevron* Soluble Oil saves firm $4,000 per year

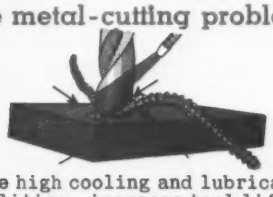


Economical Chevron* Soluble Oil replaced three specialized cutting fluids at Skagit Steel and Iron Works, saving $4,000 annually in fluid costs and storage space. Cutting speeds, tool life, work quality were maintained with no corrosion of work or machines. Skagit produces a wide variety of marine deck machinery, shoreside hoists, mobile and stationary logging equipment—uses Chevron Soluble Oil for all metal cutting operations including lathe turning, milling, drilling, broaching, grinding, and gear cutting. Gould and Eberhardt gear hobber (above) produces gear for a Skagit Mobile Logger.



Turntable Gears for mobile logger are also machined using Chevron Soluble Oil. Product is diluted in ratios between 18 and 80 parts water to one part oil, depending upon steel number and machining operation.

Why Chevron* Cutting Fluids solve metal-cutting problems



- Have high cooling and lubricating qualities—increase tool life.
- Assure precision finishes.
- Additives protect against extreme pressure, corrosion, rust.
- Very stable—will not separate or turn rancid.
- Specialized products for every metal-cutting operation.

For Full Information contact your Standard Engineer or Representative, or write 225 Bush St., San Francisco 20, California.

*The Chevron Brand covers the line of industrial products formerly sold under the Calol name. This is a name change only. The high quality and specifications remain the same.

CHEVRON Industrial Lubricants

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STANDARD OIL COMPANY OF CALIFORNIA

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WESTERN MEETING REPORTS

SO GREAT IS THE INTEREST IN THE 10TH WESTERN METAL EXPOSITION that it will not only fill the Pan-Pacific Auditorium in Los Angeles, but will spill over into four enormous canvas pavilions. Scheduled to be held Mar. 25-29 in 1957, the show in past years has been gaining momentum so fast that 53,639 spectators attended the 1955 event to inspect more than 440 exhibits. Exhibitors already planning to display products at this year's show number 475.

Technical sessions designed to supply answers to typical Western production problems and to provide a "Wall Street" for exchange of ideas, techniques, and thoughts that have been accumulated by Western metalworking and production engineers, will comprise the 10th Western Metal Congress. The Congress will be held at the Ambassador Hotel on concurrent dates. Engineering groups to be represented at the congress include the American Society for Metals, Los Angeles Section of American Welding Society, Society for Non-Destructive Testing and American Institute of Mining and Metallurgical Engineers.

A special conference on titanium will be held by the American Society for Metals. Prompted by the West's vast interest in light metals, the conference will also be held Mar. 25-29 at the Ambassador Hotel. It will reportedly be an up-to-date repeat of the first titanium conference held at university level two years ago by ASM in cooperation with New York University. Included will be a course of study increased in intensity and coverage. More information on the titanium event and the metals show and congress, can be obtained from ASM headquarters, 7301 Euclid Ave., Cleveland, Ohio.

•

"TECHNIQUES FOR RELIABILITY" will be the theme for the 1957 Western Joint Computer Conference scheduled to be held at the Statler Hotel in Los Angeles February 26-28. Sponsored jointly by the Institute of Radio Engineers, the American Institute of Electrical Engineers and the Association for Computing Machinery, the conference will cover such subjects as mathematics of reliability, new systems, applications, new components, component reliability, analog computer equipment, programming and others. Trips planned as part of the conference will include visits at Jet Propulsion Laboratory, Electro Data Corp., Ramo-Wooldridge Corp., University of California in Los Angeles, Telemeter Magnetics, Inc., Litton Industries, Rand Corp., and National Cash Register. An event related to the conference is a symposium to be presented Friday, March 1, at the Statler Hotel. Subject of the symposium will be "New computers—A report from the manufacturers."

•

FORMATION OF PHOENIX AIIE CHAPTER was well started recently at an initial meeting attended by 40 interested engineers. Elected as temporary chairman of this new American Institute of Industrial Engineers group was *Raymond A. Nelson*, Reynold Metals Co. Other temporary officers elected are *Forrest Smith, Jr.*, Arizona Products and Machine, vice-chairman, and *Robert Lidington*, Goodyear Aircraft Corp., secretary-treasurer. Highlight of the first meeting was a short discussion of the AIIE, its history, objectives, purposes, and benefits, delivered by *Dr. Merle Nutt*, assistant professor of technology and industry at Arizona State College. Of those engineers attending the meeting, 12 have officially become members of the AIIE, while 20 are prospective members.

TEMPORARY CHAIRMAN ELECTED to head-up formation of a new chapter of the American Institute of Industrial Engineers in Phoenix, Ariz. is **Raymond A. Nelson**, Reynolds Metals Co.

•

NINTH ANNUAL INDUSTRIAL ENGINEERING INSTITUTE is scheduled for Feb. 1-2 to be held simultaneously on the Berkeley and Los Angeles campuses of the University of California. Presented each year by the university's College of Engineering, School of Business Administration, Institute of Industrial Relations, and University Extension, the institute has been arranged with the cooperation of interested national societies. Latest developments in research and practice in the industrial engineering fields such as electronic data processing, reducing costs through the use of capital, mechanized time study, work measurement, human relations on the assembly line, and others will be discussed. Further information about this event, registration for which is $20.00, can be had from the Department of Conferences and Special Activities, University Extension, University of California, Berkeley 4, Calif., or Los Angeles 24, Calif.

•

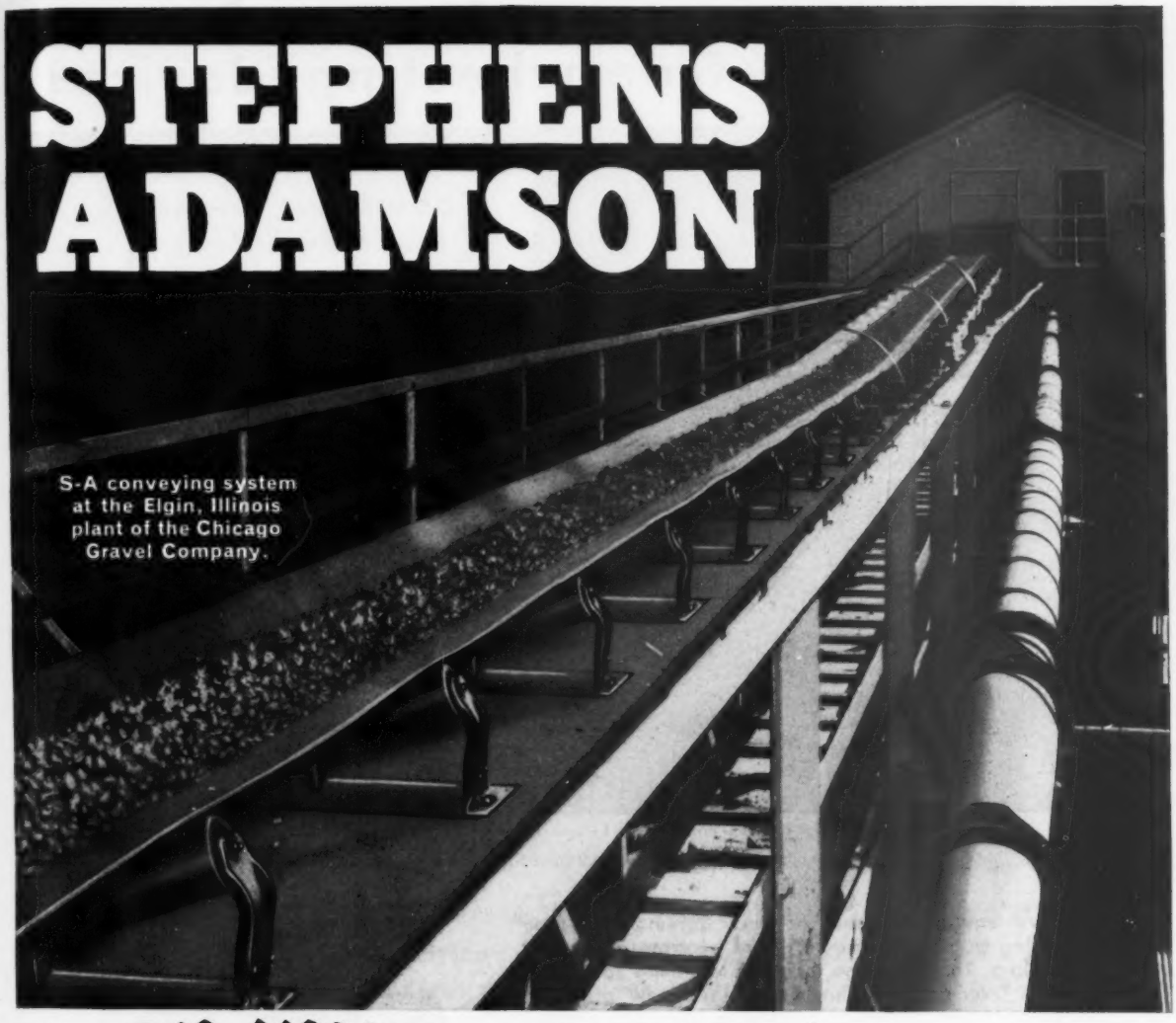
WESTERN MEETINGS YOU SHOULD PLAN TO ATTEND

Jan. 21-22—TODAY'S TOOL FOR TOMORROW'S RESEARCH, symposium sponsored by Assoc. for Applied Solar Energy, Stanford Research Institute, Arizona State College, and University of Arizona, Hotel Westward Ho, **Phoenix, Ariz.** Contact John I. Yellott, secretary, Assoc. of Applied Solar Energy, 3424 N. Central Ave., Phoenix.

Jan. 21-22 — IMPLEMENTING LONG-RANGE COMPANY PLANNING, industrial economics conference sponsored by Stanford Research Institute, Fairmont Hotel, **San Francisco.** Contact R. W. Smith, conference chairman, SRI, Menlo Park, Calif.

. . . continued on page 26

STEPHENS ADAMSON



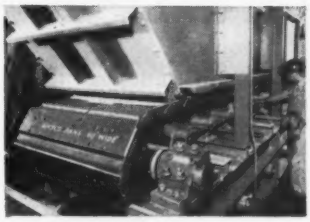
S-A conveying system at the Elgin, Illinois plant of the Chicago Gravel Company.

the *BIG NAME* in rock product conveyor systems

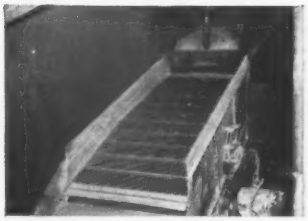
Pit and quarry operations are the roughest, toughest, testing grounds in the world for mechanized equipment and here's where you'll find those big burly S-A engineered conveying systems proving their real quality. Here they take terrific punishment, and come back for more year after year. This is where the system has got to be good or be pounded into submission fast.

This is where STEPHENS-ADAMSON has earned its big name. It's where over fifty years of experience and sheer excellence of engineering and product design pays off.

A STEPHENS-ADAMSON sales engineer is in your area. He is always ready to serve you and prove that the rock handling problem doesn't exist that can't be solved the S-A way.



S-A builds feeders in many styles and sizes. They range from heavy duty AMSCO feeders to rotary feeders for pulverized materials.



S-A screens are made in numerous types—vibrating—revolving—shaking—for screening, scalping, and washing crushed stone or gravel.

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- Belt, Pan & Plate Feeders
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- Stacking Conveyors
- Storage & Reclaiming Systems
- "Natural Frequency" Vibrating Conveyors
- REDLER Conveyor-Elevators
- ZIPPER Conveyor-Elevators
- Conveyor Belt Cleaners
- Headshaft Holdbacks
- Grizzlies & Screens
- Centrifugal Pilers
- Bin Gates & Tunnel Gates
- Car Pullers & Spotters
- Bucket Elevators
- Skip Hoists
- SEALMASTER Ball Bearing Units

• *Write for a bulletin on any of the above.*

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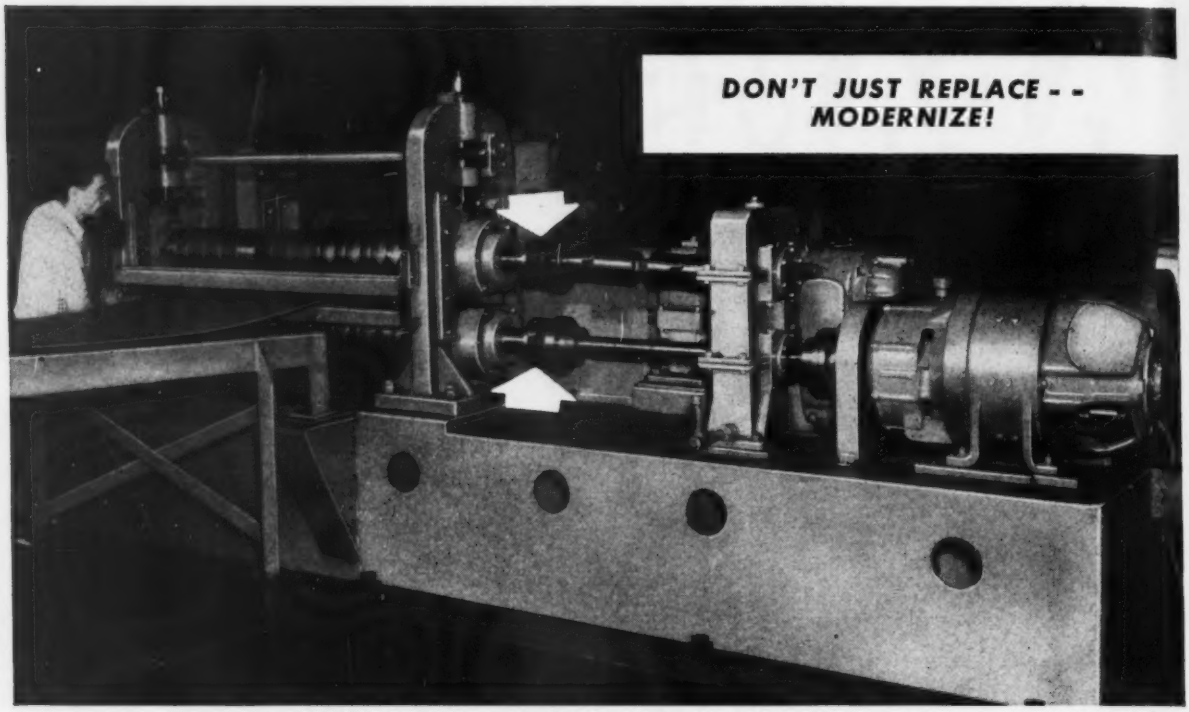
Facts you may not know about progress in free-wheeling devices

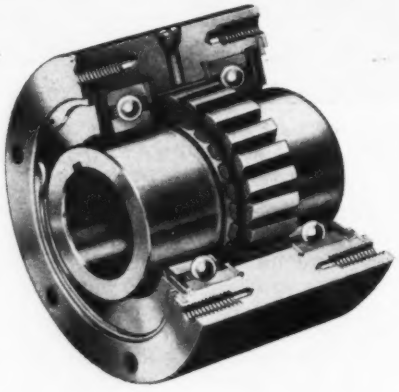


Typical of the modern concept in free-wheeling devices is this Formsprag Over-running Clutch used on a slitter. It allows the take-up reel to pull strips freely and automatically after being threaded in under power.

Progressive equipment manufacturers agree: sprag-type over-running clutches offer a far more accurate method of free-wheeling. That's why so many of them are specifying Formsprag Over-running Clutches on their new products.

Why Formsprag? Patented "D-Shaped" sprags used in Formsprag Clutches offer superior accuracy; maximum torque; and instantaneous contact and release. Slippage, often found in obsolete band brakes and other clutch types, is eliminated.

Best of all, Formsprag Clutches are easily adapted to your equipment. Change-over is quickly accomplished. The next time you replace a free-wheeling device, contact your Formsprag Distributor — he knows the complete story; stocks a full line of Formsprag Clutches.



Applications are almost unlimited. Above is a ball bearing clutch model designed for high speed, continuous over-running. It is particularly desirable for dual-drive systems.

This new 26-page brochure is crammed with tips on the use of Formsprag Clutches. Your free copy is waiting.

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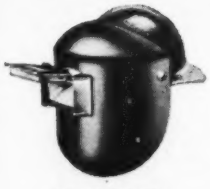
FIBRE-METAL
Quick-Lok
NEW... RUGGED... POSITIVE...
WELDING HELMET ATTACHMENT
Easy friction adjustment
Locking slot
Spring loaded . . . press button to lock or unlock!
No. 4708-P-2Q with Insulated Lift Front Glass Holder No. 1086
No. 4602-P-2Q with Insulated Steel Glass Holder No. 1085



No. 4890-P-2Q, Fibre shell, curved under chin

No. 4440-P-2Q, Fibre shell, straight bottom

Ask for Bulletin No. 49

Gives you neatest conversion to DOUBLE PROTECTION!

QUICK-LOK is the quickest, newest, connect-disconnect attachment made! Welders *need* head and "back of the neck" protection wherever there is danger of falling or flying objects on the job. Your men *will like* to *wear* this convenient, comfortable combination. For lasting protection, try QUICK-LOK today!

Fibre-Metal offers the QUICK-LOK equipped Helmet-*SuperGard* Combinations shown here (and many others) as well as the No. 4000 QUICK-LOK Kit for field conversion.

SuperGard Safety Caps are of Fiberglas. Helmets are Seamless, Fibre and Fiberglas.

QUICK-LOK FEATURES:

1. Unique, economical, practical.
2. Positive connection, quickly locked or unlocked...every time!
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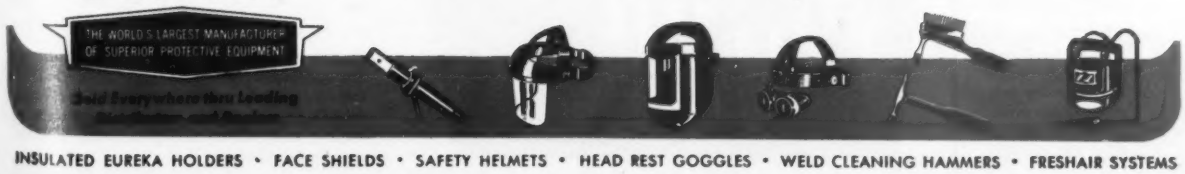

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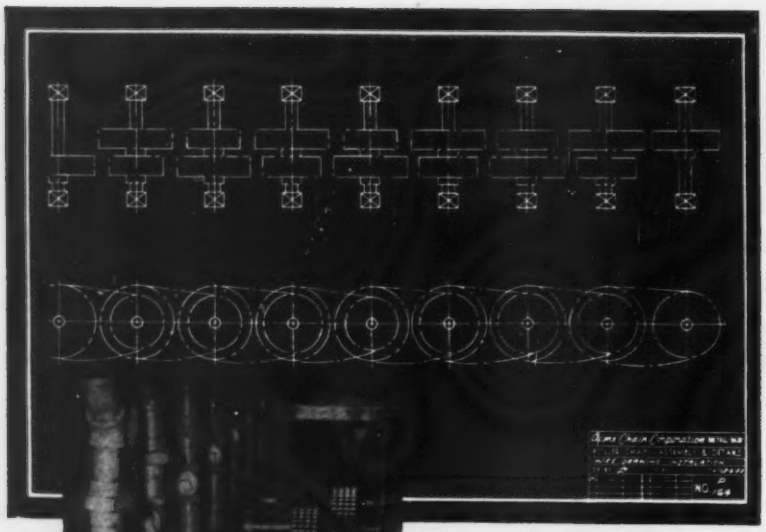

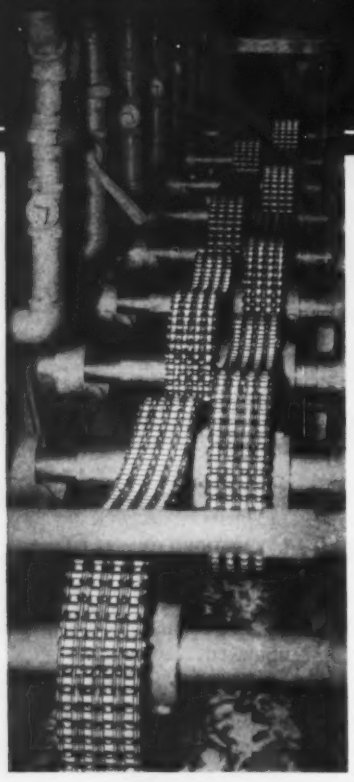

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WESTERN MEETINGS

. . . continued from page 22

Jan. 30-31 — NINTH ANNUAL COLLEGE-INDUSTRY CONFERENCE sponsored by Relations with Industry Division, American Society for Engineering Education, University of California, **Los Angeles.** Contact University of California Extension, Engineering, Los Angeles 24.

Feb. 7-8—GOVERNOR'S INDUSTRIAL SAFETY CONFERENCE, seventh annual California meeting, Biltmore Hotel, **Los Angeles.** Contact Michael Flagg, Department of Industrial Relations, Division of Industrial Safety, 965 Mission St., San Francisco 3, Calif.

Feb. 17-20—CALIFORNIA TRUCKING ASSOC., state convention, **San Francisco.** Contact Wade Sherrard, managing director, 3301 So. Grand Ave., Los Angeles 7, Calif.

Feb. 18-21—WESTERN STATES MEAT PACKERS ASSOC., regional convention, **San Francisco.** Contact E. F. Forbes, president and general manager, 604 Mission St., San Francisco.

Feb. 26-28—1957 WESTERN JOINT COMPUTER CONFERENCE sponsored by the I.R.E., A.I.E.E., and the A.C.M., Statler Hotel, **Los Angeles.** Contact S. Dean Wanless, Public Relations Chairman, Aeronutronic Systems, Inc., 13729 Victory Blvd., Van Nuys, Calif.

Mar. 4-6—ASSOC. OF IRON & STEEL ENGINEERS, regional convention, **San Francisco.** Contact T. J. Ess, managing director, 1010 Empire Bldg.. Pittsburgh 22, Pa.

Mar. 18-21—SOCIETY OF THE PLASTICS INDUSTRY, INC., annual national conference, Biltmore Hotel, and Pacific Coast plastics exposition, Shrine Exposition Hall, **Los Angeles, Calif.** Contact society headquarters, 250 Park Ave., New York 17, N. Y.

Mar. 25-29—AMERICAN SOCIETY FOR METALS, tenth Western Metal Exposition and Congress, Pan-Pacific Auditorium and Ambassador Hotel, **Los Angeles.** Contact W. H. Eisenman, managing director, 7301 Euclid Ave., Cleveland 3, Ohio.

Apr. 16-17—37th PACIFIC COAST MANAGEMENT CONFERENCE, regional conference, Claremont Hotel, **Berkeley, Calif.** Contact Everett Van Every, secretary-manager, Western Management Assoc., 2180 Milvia St., Berkeley, Calif.

Apr. 24-26—THE SEVENTH REGION IRE CONFERENCE, Conference and Federal Bldgs. **San Diego.** Contact IRE Seventh Region Conference, U. S. Grant Hotel, San Diego, Calif.

April 24-26—NATIONAL ASSOC. OF INDUSTRIAL SUPERVISORS, 2nd regional convention, Ambassador Hotel, **Los Angeles.** Contact L. W. McKrill, executive secretary, 15032 Hilliard Rd., Cleveland (Lakewood), Ohio.

May 7-12—19TH ANNUAL CONVENTION OF THE NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS, Fairmont Hotel, **San Francisco.** Contact William N. Wilson, executive secretary NAAMM, 228 No. LaSalle St., Chicago 1, Ill.

...new yardstick for measuring profits!

Towmotor Mass-Handling—moving more units faster, at lower cost—can well be the investment that promises greatest improvement in your future profits, as you face continually rising costs and a shrinking manpower pool.

Integrating Towmotor lift trucks in your departmental operations lets you *supplement* your personnel without adding to your payroll. Enables your men to do a bigger day's work *easier*. Sends them home *fresher*. Permits each one to handle jobs you'd pay a *crew* to do!

Have you seen the new Towmotor lift trucks lately? They offer a wealth of "first-time" features such as:

- Fatigue-free adjustable seating
- Motion-saving "centralized control"
- Maximum free lift that tops all
- No-loss hydraulic lifting action
- Power steering that saves 80% of operator's efforts

Get Bulletin SP-23 on new Towmotor lift trucks from Towmotor Corporation, Cleveland 10, Ohio.

Leaders for 38 years in building Fork Lift Trucks, Tractors and Carriers

TOWMOTOR ® THE ONE-MAN-GANG — GERLINGER

Gerlinger Carrier Company, Dallas, Oregon, is a subsidiary of Towmotor Corporation, Cleveland 10, Ohio

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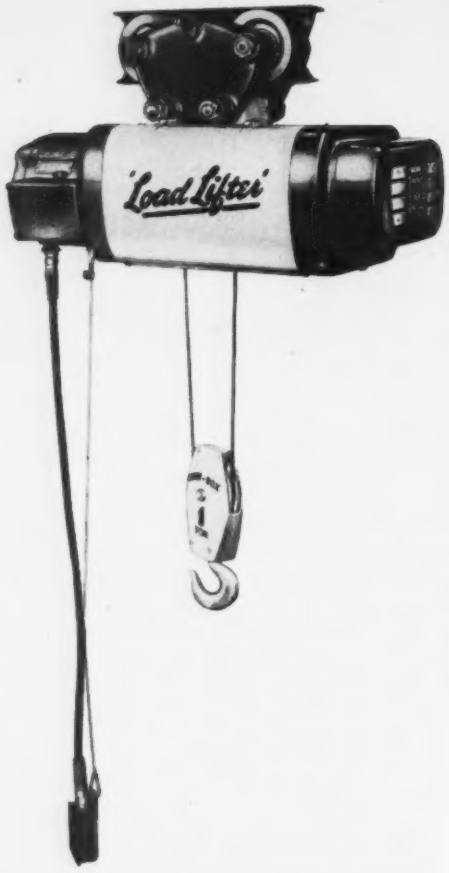

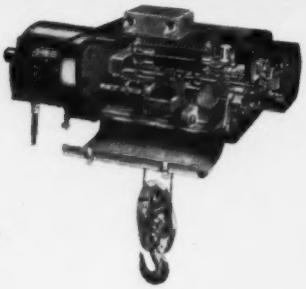

The Series "700" 'Load Lifter' has the fewest possible working parts to simplify maintenance. All units are easily accessible for inspection; the hoist can be serviced in the air. Down time is reduced — real economy for you.

This efficient motor-driven trolley provides effortless hoist travel at the push of a button. Available for Series "700" 'Load Lifter' Hoists already in service. New hoists can be so equipped before shipment; no additional assembly required.

STEP UP lifts per hour

Lifting loads up to 15 tons on a heavy-duty cycle is a job for a tough hoist. The Series "700" 'Load Lifter' Electric Hoist more than meets every requirement in speed, stamina and safety. A ton can be lifted a foot a second. Extra ruggedness is built into every part to assure top performance under the worst conditions of service. The automatic load and motor brakes are interlocked to operate simultaneously, yet either brake *alone* can hold the full load safely. Only 24 volts at the pendant

STEP DOWN cost per lift

control is a plus in safety. Two-speed models provide a "low" that is 1/3 the speed of "high".

The Series "700" 'Load Lifter' is available with lug or hook and push-type, hand-geared or motor-driven trolley. Learn how this husky electric hoist is saving time, effort and money in all kinds of plants, and how it can do the same for you. *Ask your "Shaw-Box" Distributor for details or write us for Bulletin 410.*

57 G-1

MAXWELL MANNING & MOORE INC. M&M TRADE MARK

'Load Lifter'® **ELECTRIC HOISTS**

MANNING, MAXWELL & MOORE, INC.

SHAW-BOX CRANE & HOIST DIVISION

392 West Broadway • Muskegon, Michigan

Builders of "SHAW-BOX" and 'LOAD LIFTER' Cranes, 'BUDGIT' and 'LOAD LIFTER' Hoists and other lifting specialties. Other Divisions produce 'ASHCROFT' Gauges, 'HANCOCK' Valves, 'CONSOLIDATED' Safety and Relief Valves, 'AMERICAN' and 'AMERICAN-MICROSEN' Industrial Instruments, and Aircraft Products.

In Canada: *Manning, Maxwell & Moore of Canada, Ltd., Avenue Road, Galt, Ontario.*

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from the largest to the smallest

STEEL

call Jorgensen first!

Here you will find the West's most complete stocks of steel and aluminum to meet the growing needs of Southland industry — from automotive and aircraft to mining and manufacturing. Jorgensen experts will help you select the *right* material for the job. So — whether you buy by the pound or the ton — *call Jorgensen first!*

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Report from Western Industry:

"It's good business to haul with WHITE"

Four different specialized White Truck models serve the Redwood Company of Denver in supplying sand, gravel and bulk cement to ready-mix concrete companies throughout Colorado.

—J. A. "Red" Miller
president
Redwood Company, Inc.
Denver, Colorado

Latest addition to the Redwood Company's growing fleet of Whites is this new Model WC-20, equipped with 5 yard body and hoist, 340 Cu. In. Mustang Engine, 3 Sp. Aux. Transmission and 9.00 x 20 single front dual rear tires.

"Construction schedules can't wait! With the stepped up consumption of concrete aggregates, carriers such as the Redwood Company must provide prompt, unfailing deliveries when materials are needed. To render this uninterrupted service to our customers, we find it *good business to haul with White Trucks,"*—reports Redwood's youthful president, "Red" Miller.

How does *your* equipment measure up to today's demands? Analyze it from every angle . . . cost, maintenance, dependability! Take a good look at your hauling problems, then look to White for the answers. Your local White Representative can show you in black and white why it's good business to haul with White. Call him today!

THE WHITE MOTOR COMPANY
CLEVELAND 1, OHIO
Factory Branches, Distributors and Dealers Everywhere

White

FOR MORE THAN 55 YEARS THE GREATEST NAME IN TRUCKS

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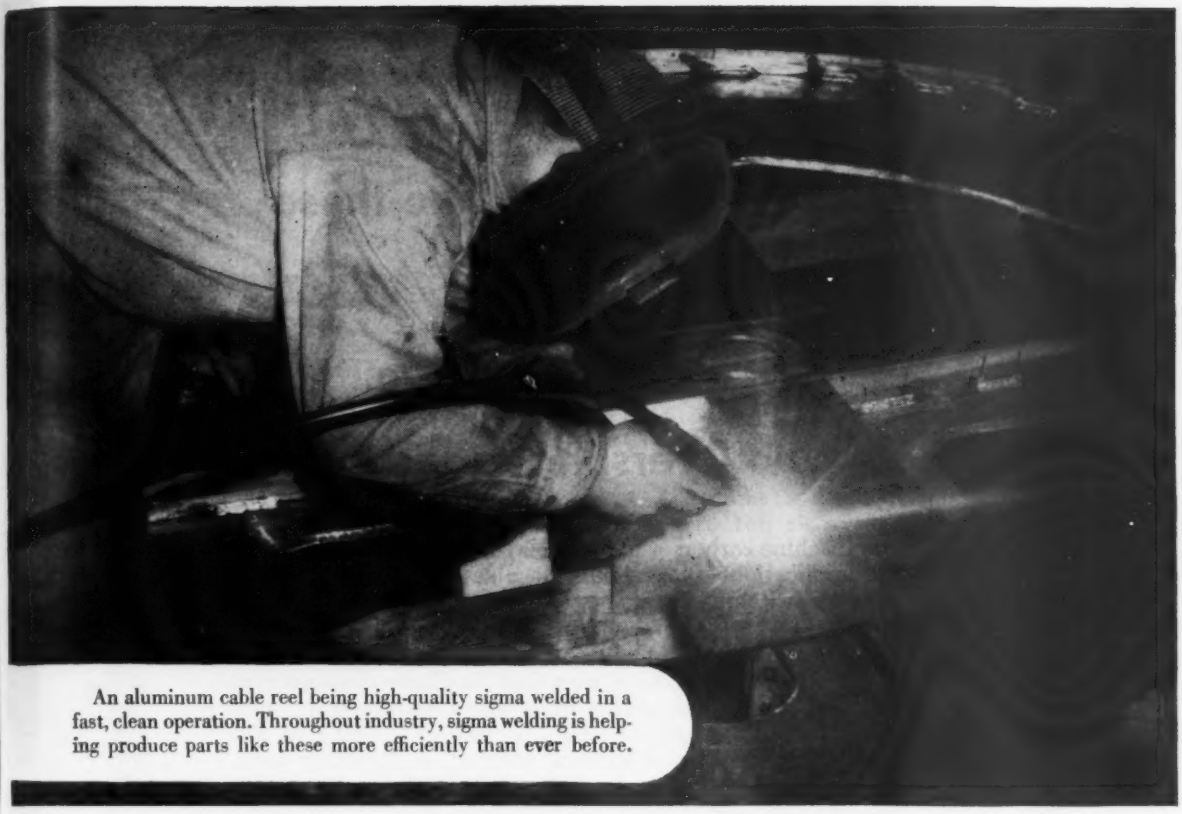

An aluminum cable reel being high-quality sigma welded in a fast, clean operation. Throughout industry, sigma welding is helping produce parts like these more efficiently than ever before.

SAVED-50% of fabricating cost . . .

by using

SIGMA WELDING

Sigma welding's combination of automatic wire feed, and dependable argon gas-shielding accounts for the fifty per cent cost saving made in fabricating aluminum cable reels like the one shown above. Top quality welds are made in these ¼ and ½ inch thick aluminum parts at speeds up to 20 inches per minute—and no post weld treatment is necessary.

The Ease of Handling gained by automatic wire feed both simplifies and speeds welding operations. A shield of inert argon gas envelopes and protects the weld puddle from harmful effects of the atmosphere, and eliminates need for flux.

Sigma Welding Is Ideal for a Wide Range of Jobs because it joins all commercially fabricated metals, and can attain full penetration up to ¼ inch in a single pass. A complete line of portable manual, and automatic mechanized apparatus is available—and all are easy to operate and maintain.

For more information on sigma welding, or on any of LINDE's modern methods of joining metals, call your local LINDE representative—or write for free illustrated literature. Start saving now, do it today.

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If you machine parts like these...

we can save you UP TO 30%

...with Ryerson leaded steels

If you machine carbon or alloy steels for production or maintenance applications—you should be able to make substantial savings by switching from a standard steel to a Ryerson *leaded* steel.

We can tell you about customers who produce up to 50% more parts per machine hour, now that they have changed over to a leaded steel recommended by Ryerson. Others report tool life lengthened as much as 300% . . . rejects reduced to all-time lows . . . machine down-time slashed . . . finishing processes eliminated.

The nation's largest stocks of leaded steels in a wide range of types and sizes are ready for quick shipment from Ryerson. (See listing below.) Each is the fastest machining steel of its type available anywhere. If you are not now using leaded steels, it will be worth your while to investigate the possibility of adapting one of them, or several, to your operations.

A Ryerson representative will be glad to work with you. Show you dozens of case histories—good hard facts that document just how well Ryerson leaded steels have worked out under actual shop operating conditions. Call your nearby Ryerson plant.

LEADED STEELS IN STOCK

CARBON STEEL BARS

Ledloy (Screw Steel) . . . Cold drawn rounds, squares, hexagons.

Rycase (Case Hardening, Low Carbon, Manganese) . . . Cold finished rounds.

ALLOY STEEL BARS

Rycut 20 (Low Carbon, Case Hardening) . . . Hot rolled and cold finished rounds.

Rycut 40 (Medium Carbon) . . . Hot rolled and cold finished rounds, annealed to heat treated and stress relieved.

Rycut 47 (Medium Carbon) . . . Hot rolled, annealed rounds.

New Rycut 50 (Medium Carbon) . . . Hot rolled and cold finished rounds in annealed condition, hot rolled rounds heat treated and stress relieved.

Leaded 8620 . . . Rounds hot rolled, cold finished.

Leaded 4140 . . . Rounds, cold finished, annealed or heat treated and stress relieved.

Leaded 8647 . . . Rounds, hot rolled, annealed.

CARBON STEEL PLATES

New E-Z-Cut Plates (Hot rolled, low carbon, manganese.)

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OFFICE OF THE PRESIDENT
T* WESTERN MANUFACTURING CO.

January 14, 1957

To: The Plant Operating Executive Team

NEW COMPANY POLICY ON COST REDUCTION DURING 1957

This is to notify you that the first Manufacturing Cost Reduction Committee in this company's 10-year history is hereby declared operative, composed of the following men: Plant Superintendent, Chief Engineer, Plant Engineer, Material Handling Superintendent, and Chief Purchasing Agent.

This committee will henceforth meet with me at 2 p.m. each Monday to discuss both short and long-range economies that can be effected in production, maintenance, material handling, and purchasing.

Action of this committee at the first meeting will be to plan an overall cost reduction program designed to achieve economies in every operation that appears on our accounting books as an item of manufacturing cost.

We have been far too lax in our past efforts to reduce operating costs. There have been good reasons, however. Along with thousands of other Western firms, we have had to rush the planning and provision of our new production facilities to keep our growth in step with the mushrooming market created by the West's explosive population growth. This has demanded an inordinate amount of your executive time. It has been no small problem as well that many of you, as in a multitude of new and near-new Western plants today, are relatively recent arrivals in the ranks of plant operating management, with no great backlog of experience to draw upon. You have the additional challenge of keeping well informed on today's rapid-fire developments and refinements in all types of plant operating equipment.

You should be entirely aware of the fact that, despite an increase of 46% in our sales during 1956, our overall profit margin has been dropping steadily. This is the result of many current factors: inflation and the "psychology" of an inflationary period have caused us to drift into many extravagances; more of our money is now necessarily being devoted to research and product development so that we will surely retain our competitive position; and the transition from a sellers' to a buyers' market is accelerating, forcing us to "hold the line" on prices.

In our present position, the only certain way for us to insure our continued progress as a profitable business enterprise lies in comprehensive cost reduction as a continuing integral part of our company policy.

Action at our second meeting will be a discussion of Western Industry's 1957 "Cost Reduction Idea-Book." From the 75 case histories provided there, we have an excellent checklist of specific cost reduction techniques that we can utilize immediately. Because all examples are from Western plants, we can be sure that the products involved are readily available to us here and have already proved their worth under Western plant operating conditions.

I will expect you at 2 p.m. on Monday.

*TYPICAL

A SPECIAL WESTERN INDUSTRY EDITORIAL—JANUARY 1957 COST REDUCTION IDEA-BOOK

PRODUCTION EQUIPMENT AND TOOL APPLICATION

Automatic welding speeds output and halves labor requirements

case history 1

Two carefully selected automatic welding processes teamed with specially designed fixtures have enabled Rheem Manufacturing Co., South Gate, Calif., to boost production of glass-lined hot water heaters and decrease labor costs—in one case by 50%.

Automatic argon-shielded sigma welding replaced the manual arc welding of flues to bottoms of heaters. It was selected over other automatic processes because of the small diameters involved, fit-up problems, and the necessity of holding the arc in close proximity of the joint. A Linde SWM-3 welding outfit mounted over a rotating fixture designed and built by Rheem completes this welding operation in less than 30 sec., including loading time. This process produces smooth welds which eliminate the need for cleaning and grinding, reduces arc time and percentage of rejects, and does not require a specially skilled operator.

With seams butted tightly, shell is moved forward over water-cooled back-up shoe by separately driven power rolls. Operator pushes button to weld seam at 100 in. per min.

To load fixture for welding flues to bottoms, bottom is placed in slots of turntable and flue is forced against spring-loaded insert acting as a back-up for the weld.

Speeds exceeding 100 in. per min. are attained in the automatic submerged arc welding of longitudinal seams of steel tank shells from sheets of 10 and 14 gage thicknesses. Welds are smooth and require little finishing. Two men, using a Unionmelt DEH welding head attached to a special fixture designed and built by Rheem, now complete the job; previously, four men using a double loading fixture were required.

Rubberized abrasive cones shape themselves for harder-to-reach surfaces as deburring and polishing of more accessible spots proceeds.

Hard-to-reach spots polished 50% faster with abrasive cones

case history 2

Production time has been cut in half and a smoother and more highly polished job is being done in Terminal Manufacturing Co.'s deburring and polishing operation in San Francisco since the plant switched to using rubberized abrasive cones. Terminal formerly used conventional grinding wheels and emery cloth to work on hard-to-reach spots on stainless steel milk tanks and other food processing equipment.

The Cratex abrasive cones used are mounted on a portable die grinder

operated at speeds of 4,000 to 14,500 rpm. The more accessible spots are worked first—deburred, polished and weld and solder lines blended. As the cone diminishes it shapes itself for use on the surfaces which are harder to reach. Coarse grit is used for light deburring and blending, followed by medium grit for a smooth final polish. The resultant highly polished surface, free from scratches and crevices, reduces the danger of bacterial contamination and makes cleaning the milk tanks a simple job.

Shellcasting cuts close-tolerance parts production cost 80%

case history 3

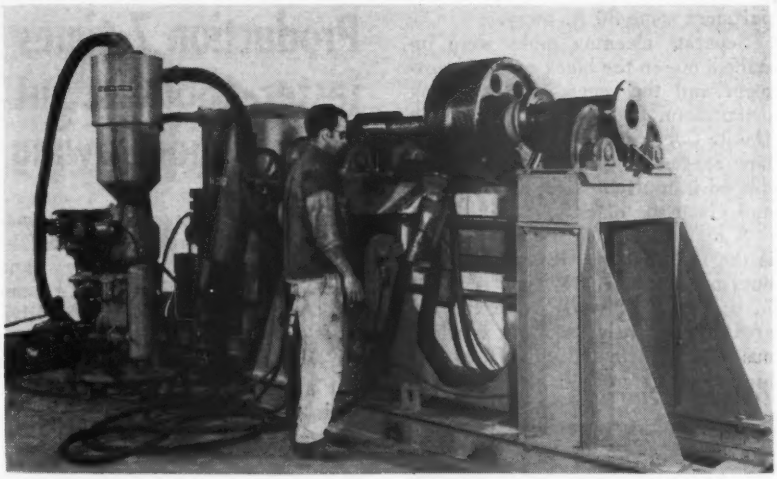
Cost of producing transmision gear-selector bell-cranks has been slashed 80% at Kenworth Motor Truck Co., a Pacific Car and Foundry Div., in Seattle, Wash., by a new casting process.

So critical are the tolerances involved in the bell-cranks that Kenworth had been hard plating them for extra wear after they were machined. At the suggestion of Electric Steel Foundry Co. in Portland, Ore., Kenworth had the foundry company cast some of the units in Esco Alloy 12M. The Esco Shellcasting process

Formerly hardplated to give it strength to withstand extra-hard wear, this transmission gear-selector is now strengthened at less cost by a differential hardening process.

produced a unit capable of withstanding the extra wear without hard plating operations. This was accomplished through the differential hardening process in use at Esco.

Now, all such units used by Kenworth are being produced without grinding or plating and 60% of the former machining operations have been eliminated.



In-plant shot peening is often done while gears are still in finishing machine tools at Westinghouse. Peening equipment has wide range of drive speeds with infinite control.

Low-cost in-plant shot peening saves gear finishing dollars

case history 4

By installing its own shot peening equipment, in its Sunnyvale, Calif., plant Westinghouse Electric Corp. has eliminated the cost involved in shipping gears to Los Angeles and back for the finishing operation. No local shot peening services were available so the semi-finished gears, which required only a light skin cut for finishing after peening and had to be handled and packed with extreme care, presented a costly problem.

Westinghouse observed for a time the shot peening principle used in equipment manufactured by Vacu-Blast Co. in nearby Belmont, Calif. It was known to perform well using steel abrasives (steel grit) on flat or gently contoured surfaces, but whether or not the shot within the Vacu-Blast gun would remain confined as the brush traveled over teeth of the gear was questionable.

To determine the all-important answer, a test set-up was built in Vacu-Blast's plant. The gear was rotated on a set of standard turning rolls driven by a vari-speed motor. The Vacu-Blast gun is mounted on a traverse screw, also powered by a vari-speed drive. Thus, a combination is provided that makes an infinite number of coverage speeds possible.

Using shot varying from SAE P11 (.011 in.) to SAE P33 (.033 in.), the test proved that the system would meet Westinghouse's requirements. The shot is blasted continuously against the gear face during the peening operation. Vacuum abrasive recovery is used continuously to retain shot from the blast gun to the generator. In the generator a reclaimer separates the broken shot from the charge and perfectly round spheres are used at all times.

In some cases the peening is done in the machine tool that is to finish the gear. This is accomplished by moving the Vacu-Blast generator and dust collector to the tool.

Alkaline tank set-up cuts parts cleaning costs 80%

case history 5

Replacing its vapor degreasing process with alkaline tank cleaning has cut parts cleaning costs by 80% for a Southern California manufacturer of steel rods used for ash tray holders.

The plant's cleaning process takes place before the parts are black oxide finished. Vapor degreasing method previously in use cost the plant $15 per day in charging expense alone. And parts had to be carried to and from the degreaser in the plating de-

partment some 80 ft. away.

Separate cleaning tanks were installed, one in the black oxide department and the other in the plating department. Both were charged with Oakite Composition No. 26. Parts are now soaked in this solution, rinsed, dipped in muriatic acid, rinsed again and given the black oxide finish.

A major factor in the cost savings is the fact that the cleaning solution does not lose strength when it is not in use. Loss of vapor from the degreaser previously used was continuous and contributed greatly to the high cleaning cost.

No flux removal or grinding are necessary after tungsten inert gas welding of aluminum.

Inert gas welding boosts weld quality and reduces upkeep

case history 6

Fast, clean and economical welding of aluminum required in the effective manufacture of aluminum oscilloscope chassis has been made possible for Tektronix, Inc., of Portland, Ore., by the tungsten inert gas welding process. Thus, no flux removal or grinding, ordinarily accompanying a weld of this type, is necessary.

The high quality welds are being produced on practically a maintenance-free basis. A producer of cathode-ray oscilloscopes and auxilliary electronic instruments, this rapidly growing firm selected Miller Electric a-c. inert gas arc welding machines for the process. Thousands of units have been produced with little or no maintenance cost.

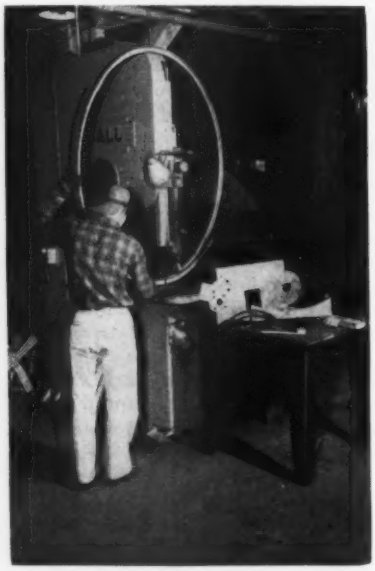
Production 7 times faster, tool cost cut with friction sawing

case history 7

Production rate in machining operation at Food Machinery and Chemical Corp's Canning Machinery Division in San Jose, Calif., is now seven times faster and tool cost is eight times less since a friction sawing machine went into operation. Trimming a large stainless steel ring used inside pressure cookers manufactured at this plant presented the problem.

The cookers are huge machines engineered and built for heavy-duty, continuous production. Vigorous standards of cleanliness and sanitation required in the food processing industry plus high strength required for pressure cookers make stainless steel the ideal material for the ring involved. However, stainless steel can be a difficult metal to machine.

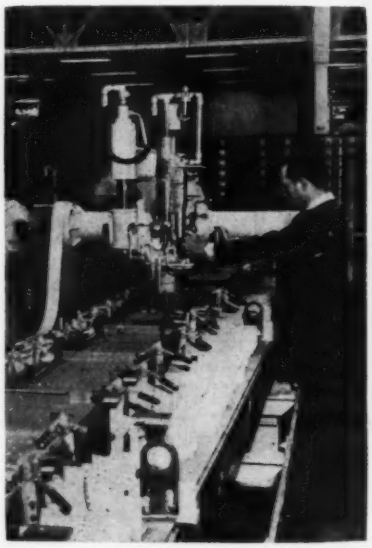
Due to the ring's size and shape, a high speed DoAll Zephyr was the tool chosen to friction saw the piece. In the friction sawing method, the saw blade moves at extremely high velocity—as high as 15,000 fpm.—so that the teeth rubbing against the metal being cut generate enough heat by friction to actually soften it just ahead of the blade. Teeth can then easily remove the softened metal and very little feeding force is required.



Operating at speeds up to 15,000 fpm., this friction sawing unit requires little feeding force. "Pre-heating" softens metal for cutting.

Speed at which the stainless steel ring can be cut is limited only by the operator's dexterity. Trimming the piece by the previously used method required a full hour of machine time. Time required by friction sawing is only 5 min., or 8.3% of previous machining time. Tool cost by the older method was $1.25 per piece. Friction sawing has cut this figure to $0.07 or only a little more than ½% of the former cost.

Other stainless steel pieces are also machined by friction sawing at FMC's Canning Machinery Division. Some of these would be extremely difficult to produce by any other method.



Flexibility is keynote of air-powered drilling here. Unit is easily positioned and operating cycle is automatic.

Air-powered drill simplifies aircraft parts production

case history 8

The flexibility of an air-powered drill has simplified drilling of the rear spar assembly of Boeing Aircraft's KC-135 Stratotanker now being produced near Seattle, Wash.

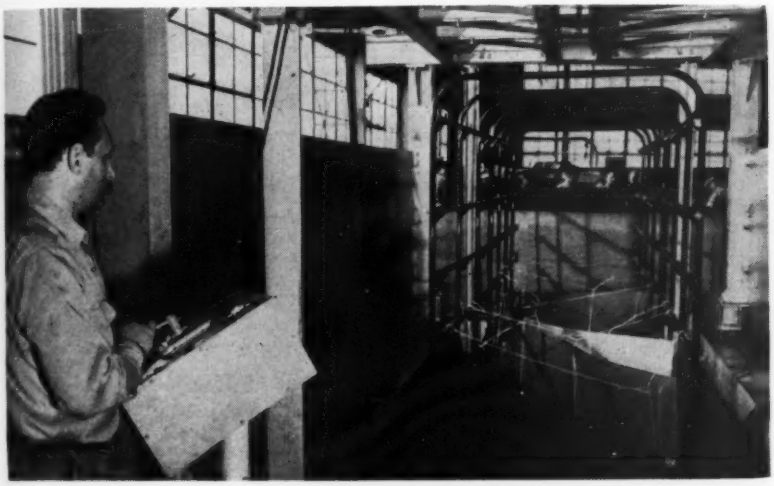
The drill is mounted on the rotating head of the swinging arm on the bridge of a gantry drill jig. By moving the bridge, arm and head, the drill is positioned anywhere along the length of the work table. By means of a rack and gear, the head is then lowered to locate the drill in the drill bushing tip. Pushing the

poppet valve control starts the operating cycle: drill, retract, shutoff—all automatically.

Besides drilling, the Keller Airfeedrills may be used for automatic peck drilling, skip drilling, countersinking and spotfacing. Torque control of the drill is adjustable. Hydraulic feed control is also adjustable up to a maximum thrust of 360 ft. lb. at 90 psig. line pressure. The operator may advance the drill without rotation to change drills or spot the drill point.

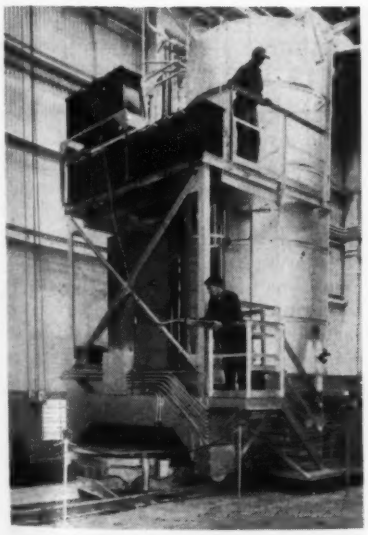
The drill features the "sensing rapid advance" movement, with this drill advancing at the rate of 2 ft. per sec. until it contacts the work. Upon contact, the drill automatically shifts to the selected rate of feed. Drill breakage on contact with the work is practically eliminated due to the proper balance of the rapid approach rate and the instantaneous action of the hydraulic control.

The length of stroke for this particular series of Keller Airfeedrills is 3½ or 6 in. Drilling speed at 90 psig. varies from 150 to 10,000 rpm. The weight is less than 32 lb.



Parts up to 14 ft. long are handled by Boeing's traveling heat treating set-up. Quench tanks (above) are floor level units providing complete control of quenching operations.

Traveling heat treating unit saves on valuable plant space



Traveling furnace passes over quench tanks. Maximum load at 1,600 deg. F. is 4,000 lb.

case history 9

Although Boeing Airplane's traveling heat treating furnace is the largest of its kind in the United States—this gives a rough gage as to initial cost—its use in the production of structural steel parts for the B-52 jet bomber has been a cost reducing factor because less space is required for the operation, and complete quench control and minimum distortion of parts are provided.

Handling parts up to 14 ft. long for an aircraft 185 ft. in wing span and 156 ft. long, the heat treating set-up is a vertical line arrangement consisting of a pit-type loading station, three floor-level quenching tanks and a partially recessed draw furnace. The traveling furnace has a charge space 14 ft. high and 5 ft. in diameter. Maximum work load is 4,000 lb. at 1,600-deg. F. or 1,000 lb. at 2,050-deg. F. Three 105-kw. heaters provide three-zone heating.

The furnace passes over quench tanks so large that it takes a tank car of oil to fill each. Operating between 100 and 400-deg. F. the martempering quench tanks contains E. F. Houghton Co.'s Martemp oil No. 2. The oil is heated by eight 10-kw. thermostatically controlled heaters. Heated by three 10-kw. heaters, Houghton No. 2 soluable quenching oil is contained in the second tank. Even temperature is maintained in both tanks by use of a 7½-hp. motor-driven agitator.

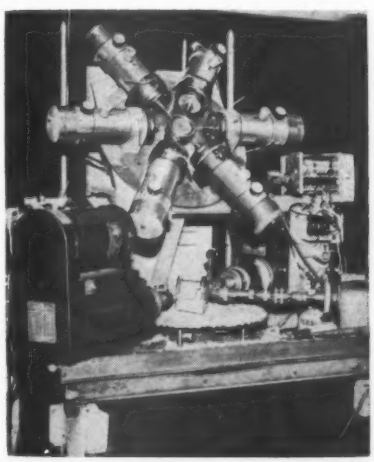
The draw furnace will hold 4,000 lb. of work at 1,450-deg. F. Temperature is closely controlled by three 75-kw. heaters. Using raw fuel gas (propane), an Endogas generator supplies the atmosphere.

Recess-tap-drill operation speeded by automatic drills

case history 10

A special machine set-up involving three types of automatic drilling units has enabled Presto Line Corp., Los Angeles, to reduce its per-piece cost in recessing, tapping and drilling zinc die castings. Pieces flow through the new continuous-operation, one-operator set-up at the rate of 260 to 300 without scrap losses and with tolerances held well within specifications.

The setup consists of two Dumore automatic drill units mounted on a



Double-action is provided by this automatic drilling set-up. While lower units recess and tap, upper units are drilling.

work table with simple nose brackets, one on the right front corner and the other located diagonally opposite. These recess both ends of the castings at the same time with Tru-Arc tool attachments. On the other two corners, also diagonally opposed, are two Dumore Drill-N-Tap units which tap both ends of the castings simultaneously. after they are indexed automatically from recessing position.

A cam operated by a small electric motor controls the operation of the tools in both recessing and tapping operations. The operator then places the workpiece on a fixture above, consisting of six Dumore automatic drill heads which drill six 3/32-in. holes in each piece simultaneously.

During the flow of work through this special machine, Presto Line gets a bonus operation without extra manpower. While the table set-up is recessing and tapping pieces, the upper set-up of six drill heads drills the six holes required. One operator easily handles the workpiece twice, but in practically one continuous operation.

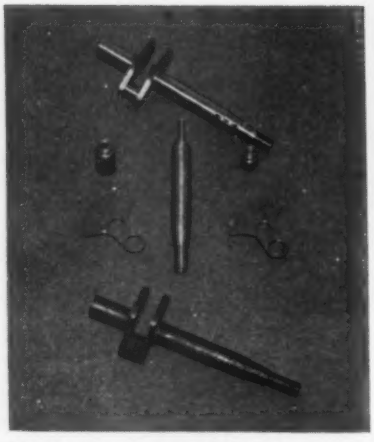
Metal brazing services cut crankshaft production costs 420%

case history 11

A 420% savings on a single part that spelled the difference between producing a product or abandoning its design was realized recently by Seaward Manufacturing Co., Long Beach, Calif., manufacturer of outboard motors. The savings and means to successful and competitive production were gained through use of locally available metal brazing services.

The part in question was the crankshaft for a small, competitively priced outboard motor. Original design for this little motor called for a forged and machined crankshaft. Cost of this single component was so great that the final retail price of the motor would have exceeded that of the competitive brands.

As a last resort, W. W. Fischer, owner-manager of Seaward Mfg. Co., contacted Fabriform Metal Products of Los Angeles on the possibility of fabricating the crankshafts by brazing. The idea was to produce the shaft in five separate components—the two crankshaft throws as simple metal stampings, and the journal and shaft ends as simple turnings—then press-fit and braze them together into the final crankshaft assembly.



TOP: Completed brazed crankshaft.
CENTER: Five components of the unit.
BOTTOM: "Too-costly" forged crankshaft.

Conveyerized and atmosphere-controlled electric furnaces are used in the metal brazing process that beat this strength problem.

This was a relatively simple job for Fabriform Metal Products, one of the West Coast's largest service brazing shops. A bit of pre-production "costing" proved that the braze-fabricated shafts could be produced for approximately one-fifth the cost of the forged and machined shafts. Because of this, the final retail price of the outboard motor would be in the competitive bracket.

A few prototype brazed shafts were produced to prove the fabricated design. In destructive tests, it was determined that the brazed shafts would withstand greater torque loading than forged shafts.

Today, shafts are being delivered to Fabriform Metal Products in the five-component form. The components are first thoroughly cleaned by degreasing, then press-fit together. The necessary copper brazing rings are placed, and the shafts are brazed at 2,050° F. in one of the company's large, conveyorized controlled-atmosphere electric brazing furnaces. When they are returned to the customer, they need only a final grinding prior to installation.

A single coat of adhesive applied to inside surface of plastic luggage case is allowed to dry completely before lining is installed.

Adhesive eliminates luggage liner fastening problem

case history 12

A method of fastening lining material to plastic luggage interiors without piercing the molded plastic outer material has been found by Durabilt Luggage Co. in Seattle, Wash. Used for the fastening job is a synthetic rubber base adhesive.

An adhesive that has been standard in the luggage industry for many years was first tried but proved to be too brittle and would not adhere satisfactorily to the polyester resin case. Various other types of adhesive were also tried, but the only adhesive found that would meet the requirements of both flexibility and high adhesion to the polyester case was Minnesota Mining and Manufacturing Co. Adhesive and Coatings Div.'s adhesive EC-1359.

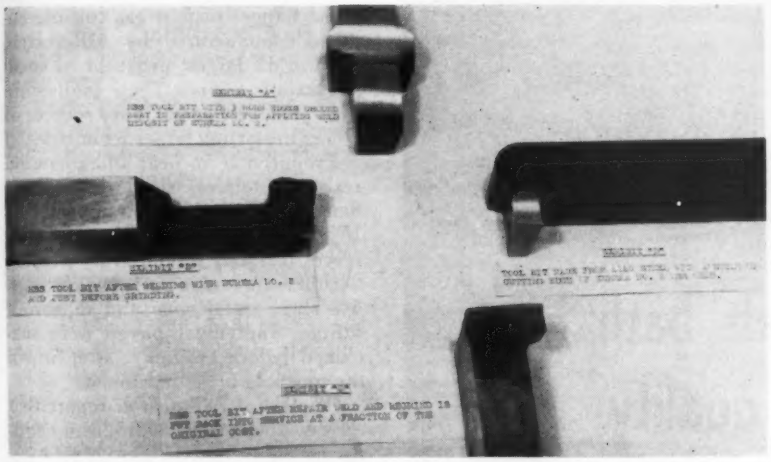
At first a manufacturing process was set up whereby the 3M adhesive

was used as a primer in conjunction with the standard luggage adhesive. However, further investigation showed that the new adhesive would in itself give an excellent bond. This eliminated one step in the manufacturing operation, and increased production to a planned minimum of approximately 400 units per eight hr. shift.

One coat of the adhesive is applied by brush around all inner edges of the case at a width of about 4 in. and air dried for a short period of time. A brush coat of adhesive is then applied on the back of the lining material and, within approximately 30 sec. (while the adhesive still contains a fair amount of solvent), the liner is positioned and pressed into contact with the dry adhesive film. The cases are then ready for further processing.

The 3M adhesive is a neoprene rubber based general purpose compound having retack properties and a longer bonding range than most adhesives of this type. It is especially designed to resist migratory plasticizers present in vinyl fabrics and some rubbers.

In many instances, the light color of this adhesive eliminates the necessity of careful clean-up of bonding surfaces. It has good adhesion to steel, aluminum, wood, leather and many types of vinyl and rubber. Dried films are resistant to oil, fuel, etc.



Tool reclamation consists of grinding worn cutting tools down (top), hardfacing them to "oversize" (left), or weld-repairing (bottom) and regrinding to dimension (right).

Hardface weld on used cutting tools saves $13,000 per year

case history 13

A procedure for reclaiming undersize single-point cutting tools and hard facing of soft shank tools has been applied by Westinghouse in its Sunnyvale, Calif., plant with an annual savings of $13,000.

This plant manufactures heavy equipment such as steam turbines and condensers and consumes about 800 to 1,000 high speed steel (HSS) grooving tools per year. These grooving tools are very costly and due to close tolerances on the work the tools have a short life. Rather than throwing the undersize grooving tools away, a reclaiming process was developed.

This consists of grinding the worn tools excessively undersize to get a clean solid base for good welding, and then building up the tool surfaces with several passes of Eureka No. 2 rod (manufactured by Welding Equipment and Supply Co. in Detroit, Mich.) deposited with an inert gas consumable Heliarc electrode welding process. The finished exact dimensions of the tool are re-ground and the tool is then equal in quality and life to the original tool.

This welding process can be used for depositing a tip or cutting edge on an alloy steel shank burned from plate or cut from bar stock. Cost of this type of shank is about 8% of an equivalent HSS shank. and the end product has the life and wearing qualities of a tool ground from solid HSS.

It only took one application of this portable magnetic drill press to produce enough time savings to offset its initial cost.

Portable magnetic drill press boosts production speed

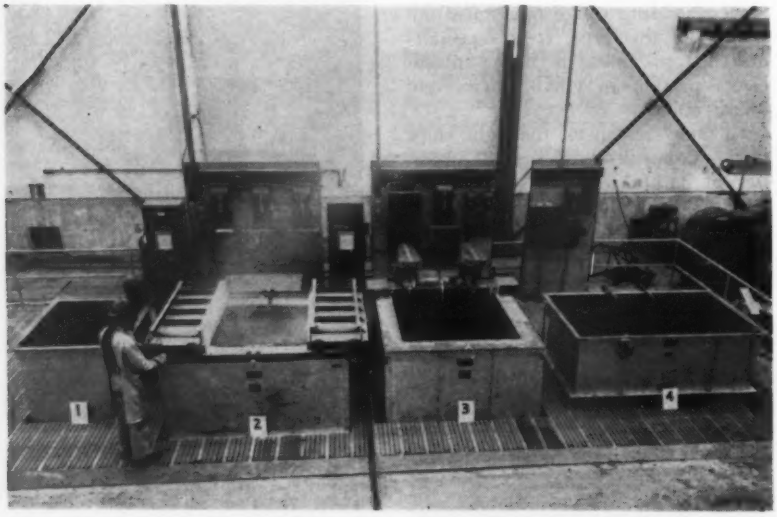
case history 14

Using an electro-magnetic drill press in its crane hoist fabrication process has produced a substantial time and dollar savings for Universal Crane Hoist and Monorail Co. in San Francisco. In fact, so substantial was the savings that the cost of the tool was offset by the cost reduction realized from its first application.

Mounting holes for wheel bogeys is one example of Universal's use of the electro-magnetic drill press. First job was to drill two holes in the partially-fabricated frame of a 10-ton overhead electric traveling crane under fabrication for a large Naval shipyard. Previously, this operation had involved moving the entire frame, with the two plates requiring drilling already welded in place, to a large radial drill press. Each plate was drilled separately and reaming of the two holes was required to obtain proper and close tolerance alignment. Use of a fitted bolt in the wheel bogey assembly requires alignment within .001 in.

Eliminating both handling time to and from the machine tool and the after-drilling reaming for proper alignment, Universal is now using a

Bux drill press—a small, portable unit equipped with an electro-magnetic base. Mounted in the portable drill press is a Stanley electric drill. The ¾-in. holes are drilled through both pieces of steel—one is 1½-in. structural material, the other is ¾-in. high carbon—in one operation. Resulting alignment between the two holes is within tolerance and no reaming is required before inserting the fitted bolt.



Complete martempering facility consists of (1) oil quench tanks, (2) austenitizing furnace, (3) quenching furnace and (4) hot water rinse tank.

West's deepest salt bath heat treat unit boosts quality

case history 15

A minimum of distortion, elimination of quench cracks and freedom from decarburization are the outstanding values gained at Rohr Aircraft by installation of the West's deepest salt bath heat treating furnaces in its Chula Vista, Calif., plant. The two units are used for martempering long steel aircraft weldments.

The austenitizing furnace—used for bringing parts up to a hardening temperature—has a bath 4 ft. sq. with a 15½-ft. salt depth. Power for this 240-kw., ceramic-lined furnace is supplied by five pairs of electrodes, installed one above the other, plus an extra pair of electrodes near the bottom of the pot.

The second unit—used for the hot salt quenching phase of the martempering operation—has a bath 5 ft. sq. and 15 ft. in salt depth. It is heated by 24 immersed resistance-type heating elements. Suitable agitation for this 120-kw. unit is supplied by two impellers each driven by a 3-hp. motor.

Both furnaces were designed and installed by Ajax Electric Co.

Standard .505-in. tensile bars of SAE-4130 martempered in these furnaces indicated superior strength of 179,250 psi., 15% elongation, and 56% reduction of area as compared to requirements of 175,000 psi., 12.5% elongation, and 48.1% reduction in area. Most common operation performed in the Ajax unit is heat treatment of modified SAE-4330 to 180,000-200,000 psi. Rohr reports that a uniform high quality product has been obtained with no rejections by using the following procedure:

(1) Normalize: Austenitize at 1650-deg. F.; soak approximately 20 min. per in. of cross section; cool in still air.

(2) Process anneal where necessary.

(3) Harden: Austenitize at 1650-deg. F.; soak approximately 20 min. per in. of cross section; quench into salt at 400-deg. F.; air cool to 180-deg. F.; rinse in water 180-160-deg. F. Parts are held above 120-deg. F. until tempered. The average as quenched hardness is Rockwell C51.

(4) Parts are tempered at 975-deg. F. for 1 hr. per in. of cross section plus 2 hr. The tempered parts have a hardness of Rockwell C41.

Frozen mercury investment casting replaces 14 pieces

case history 16

Putting into effect the engineering design freedom inherent in the frozen mercury investment casting process, engineers of AiResearch Div. of The Garrett Corp., Phoenix, Ariz. and the Mercast Manufacturing Corp., La Verne, Calif., have come up with a single casting in place of a formerly used 14-piece assembly.

The part involved is a turbine exhaust flange used in gas turbine engines manufactured by AiResearch, the world's largest producer of small gas turbine engines. These engines are used primarily as auxiliary sources of power in starting larger jet engines.

Produced from heat and corrosion resistant stainless steel, the exhaust flange measures 11 in. in diameter by 1¾ in. in thickness, and weighs 8 lb. It was formerly produced by welding together one forged ring, two castings, one sheet metal cone and numerous fittings. Individual pieces were machined before assembly, after which the unit was finish machined.

Officials of AiResearch report that the new method, in addition to eliminating all preliminary machining before assembly, has greatly reduced the amount of finish machining required. Savings are also realized in added tool life and a significant reduction of rejects.

Frozen mercury, the pattern material, welds to itself when two pieces are brought together under low pressure. This allows the production of complex shapes by preparing the pattern in several parts which are then joined together. The mold material used is a totally inorganic ceramic

Complex parts can be cast with mercury investment process because frozen mercury welds to itself when under pressure.

shell which eliminates the evolution of any contaminate or defect-causing gaseous or solid reaction products. The ceramic mold also possesses the ability to maintain dimensions and yet collapse as the casting contracts thermally, thus avoiding tears and cracks.

Rolling paint booth takes less space, power and air

case history 17

A self-propelled paint spray booth, used by the Boeing Airplane Co., Renton, Wash., to paint wing skins, spar chords, and other components of the B-52 Stratofortress, requires less than one-third the power and 20 times less air to operate than a conventional spray booth.

When painting Stratojet parts in a conventional booth, it was necessary to take them completely out of the booth after one side had been painted, turn them around and bring them back into the booth. Now, this same operation is done in half the time.

The DeVilbiss traveling booth is actually a rolling painters' platform, with its own exhaust system, air compressors, hydraulic drive motors, paint supply, and fire protection equipment.

During full operation, only 12,000 cu. ft. of air per min. are expelled through the louvered exhaust duct in the ceiling. A comparable stationary paint booth requires 20 times that amount of air. This is an especially important factor in winter when air passing into the booth must first be heated.

The ceiling duct is fitted with specially designed louvers which open only when the discharge duct of the booth is directly under them. In this way the booth can exhaust into the ceiling duct at any point along the line.

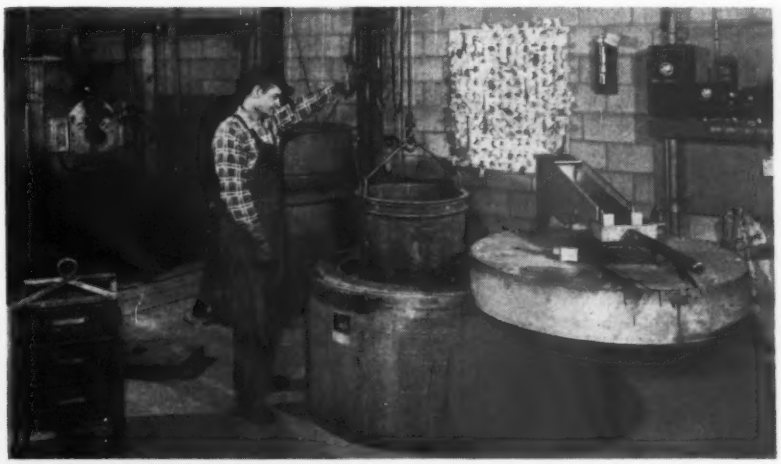
Usually staffed by two men, the booth has painters' platforms on either side, each independent of the other and easily adjustable to whatever working level is desired.

Exhaust air is drawn through a water curtain to remove overspray before it is expelled outside the building. To remove overspray from this exhaust air before it is expelled an air washer is installed on each side of the booth. These air washers require but 6 hp. to operate the water pumps while a stationary booth would need 75 hp.

Air washing equipment in the traveling model needs only 322 gal. of water per min. to operate but a stationary booth big enough to do the same job would require 7,840 gal. per min.

Another factor which makes the traveling unit more economical is the savings in floor space. Boeing figures it has saved half the floor space required by a larger, permanently located installation.

"Rolling painters' platform" complete with all equipment has doubled production in one painting operation and costs less to operate.



Four prime requisites of heat treating—accuracy, speed, versatility and trouble-free operation—are reportedly fulfilled more easily with this new pit-type furnace.

New heat treating unit does better job at lower cost

case history 18

Holister Coil Spring Co. of Los Angeles reports that it can do a better and more economical job of meeting the four prime requirements of heat treating for its customers—accuracy, speed, versatility and trouble-free operation—since installation of a pit-type furnace. Designed to operate within a tolerance of 5-deg. F. in temperature, the furnace is particularly helpful in handling heat treating jobs that vary in size, and type from load to load.

The furnace is a Pacific Scientific Floodaire unit. While the 5-deg. F. tolerance factor is adequate, a government survey at Holister has revealed an actual variation of less than 2-deg. F. Thus the prime requirement of effective and economical heat treating —accuracy—is met more than adequately.

Due to a unique element location and air circulation pattern, the furnace is capable of bringing work up to heat fast, while the high volume of circulation of air affords outstanding heating uniformity.

Valve is stronger, costs less using new epoxy insulation

case history 19

Cost of manufacturing its coaxial remotely controlled patented solenoid valves was slashed recently by Eckel Valve Co. of San Fernando, Calif., when a change in electrical insulation material was made. Also realized from the change in insulation material was production of a valve more capable of withstanding the severe thermal shock and vibration abuse for which Eckel's valves are especially designed.

Used to solve flow problems, associated with liquid and gas systems in many industrial, aircraft and rocket missile applications, the valves must be capable of operating completely submerged. To accomplish this successfully, Eckel chose to employ a semi-rigid epoxy electrical insulation system.

Called Epocast 15, the insulating product made manufacture of the valve easier and more effective because the material has particularly good flow and penetrating qualities and excellent adhesion with extraordinary low shrinkage characteristics. It provides good electrical insulation over a temperature range of minus 65 deg. to plus 300 deg. F. Chemical resistance to solvents, salt, water spray and oils were other requirements met easily by Epocast 15.

Epocast products produced more recently have increased the maximum temperature capacity of the valves to 400 deg. F. and Julian Delmonte of Furane Plastics, Inc., Los Angeles firm that produces the Epocast products, reports that long-term high temperature (500 to 600 deg. F.) insulating systems are now being subjected to active field tests. For example, a new epoxy system, Epocast 17, presents a non-volatile liquid system having three days pot life, low viscosity and relatively fast gel times in conjunction with remarkable consistent strengths at 500 deg. F. Capable of being B-staged, the strength is increased further when the system is combined with glass-fibre reinforcement.

Insulation system in this solenoid valve was greatly improved and costs cut by impregnating a new epoxy at points shown here.

New mold lube idea cuts annual lube cost by $8,000

case history 20

A simple change in the method of lubricating molds at the Los Angeles plant of Goodyear Tire and Rubber Co. of Calif. is resulting in a saving of approximately $8,000 annually in cost of lubricant, and is also helping to prevent product damage in manufacture.

In addition to tires, tread rubber, fuel cells and industrial products of all types, Goodyear California manufactures Airfoam for automotive and furniture use. The latex compound used in making Airfoam is poured into molds resembling big waffle irons. Both wide and narrow molds are used in the process. The molds are conveyed through a continuous cycle of pouring, curing, stripping, cleaning and preparing for pouring. Part of the preparation for pouring consists in spraying the molds with a liquid lubricant.

Control of the amount of lubricant used is important because it affects both the lubricant cost and the quality of the finished product, since insufficient lubrication causes the Airfoam cushions to tear when they are stripped from the mold and excess lubricant causes defects on the surface of the cushion.

Molds are lubricated by a battery of six spray guns controlled by a solenoid system actuated by the mold as it enters the spraying chamber. Originally, the guns were aimed to assure lubrication of the widest mold entering the chamber. When the mold was narrow, this caused a waste of lubricant and the setting of the spray guns gave insufficient lubrication to the

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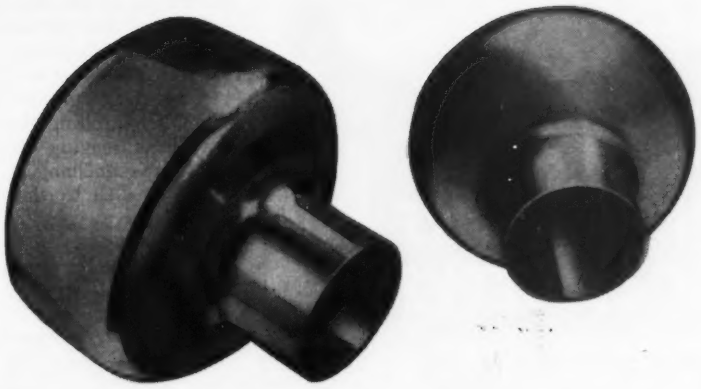

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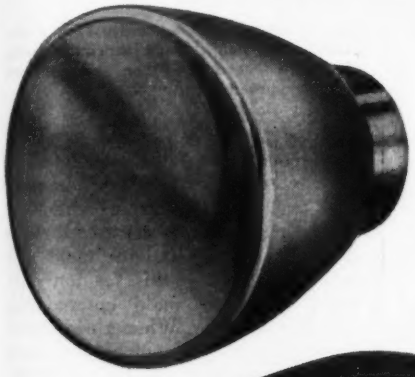

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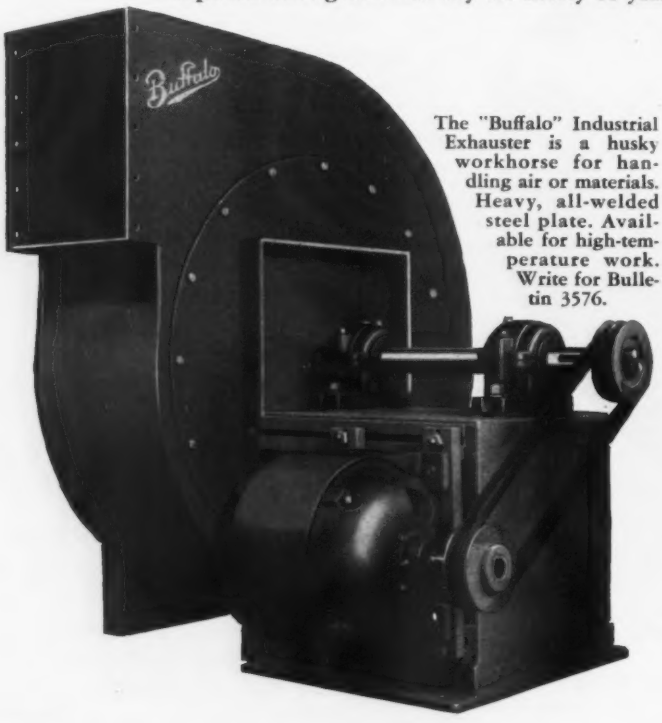

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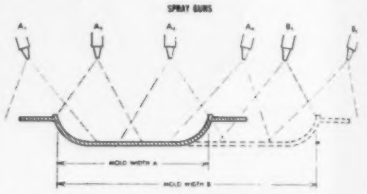
rear flange of the narrow mold.

To solve this problem, shift foreman Clarence Peterson recommended that wide molds be equipped with an extended flange to actuate a separate solenoid controlling three of the six spray guns, leaving operation of the other three unchanged. Two of the guns controlled by the new solenoid

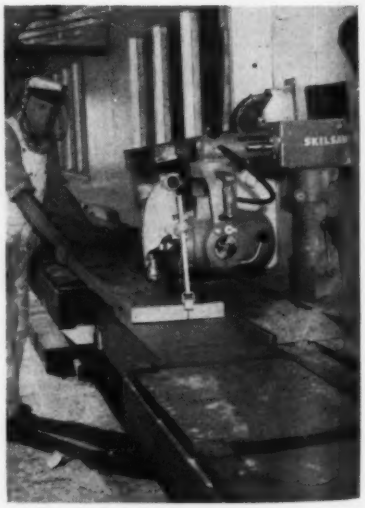


Carried out at nominal expense, this employee-suggestion for mold lubricant spraying eliminated lubricant wastage and cut down on time required for spray adjustment.

were set to assure lubrication of the wide mold and would be actuated by the new solenoid only when a wide mold entered the spraying chamber. The other gun was set to lubricate the flange of the narrow mold and would function in this fashion only when a narrow mold entered the spraying chamber. When a wide mold entered, the new solenoid system would act to shut off the air supply for this gun.

case history 21

450-sq. ft. space saved



Replacing two other cutting units, this Skil radial saw has been put to good use in the maintenance department at W. P. Fuller & Co.'s South San Francisco, Calif., plant. It is used to cut wood and steel. Operators report that it is "easy to operate in fast adjustments and faster cutting." The paint and varnish manufacturing plant saved 450 sq. ft. of valuable plant space by replacing two units with the new one.

Model MCR retractable tank, heavy duty filter. Capacities 100 sq. ft. to 1000 sq. ft. of filtering surface. No breaking of pipe connection. Quick opening cover. ASME approved.

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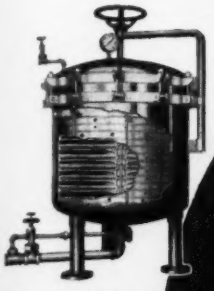
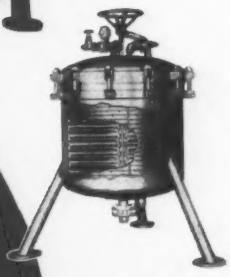
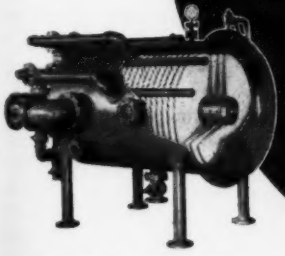


Standard horizontal plate filter. Has positive cake stability under all conditions, even with a complete shut down of filtering.



Beer polishing filter. Removes all yeast cells and a large percentage of bacteria. Produces a beer of greater stability and longer shelf life.



Model SCJ heavy duty water filter. Designed for industrial plant water, municipal water supply and swimming pools. Available in capacities up to 5,000,000 gal. per day.

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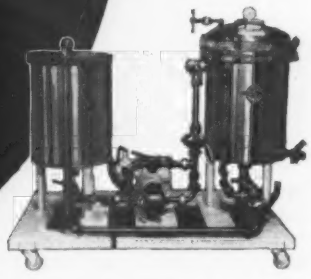

All stainless steel horizontal plate filter with stainless steel piping valves, and slurry tank. For sanitary operation on food products.

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POWER & MECHANICAL POWER TRANSMISSION

40% less labor in pipe dimpling operation with hydraulic power

case history 22

By taking maximum advantage of hydraulic design, Dura-Vent Corporation, Redwood City, Calif., producer of gas-vent pipe and fitting, recently reduced labor costs involved in a manufacturing operation by 40% over the estimated costs employing mechanical methods. Using hydraulic power, two new machines for forming the spacing indentations in the outer pipe wall are each capable of producing 1,000 cycles per hr.

The vent pipe consists of an inner aluminum wall and an outer galvanized wall with an air space between them to provide the requisite heat insulation. To maintain the correct spacing to close tolerances without the use of additional spacers, four dimple-shaped depressions are formed in one end of the outer wall and four wedge-shaped indentations in the other end. When the smooth inner wall is slipped into place and riveted, the eight inward projections in the outer wall insure that the air space is uniform both radially and axially.

With the hydraulically powered presses, an operator simply places a length of the formed outer wall into the die. This automatically triggers a limit switch to drive the hydraulic cylinders inward, whereupon the dies press the four indentations into the pipe simultaneously. The machine automatically then returns to the "stop" position. With this system, there is no chance for mislocation of the vent pipe in the die and the indentations are correctly positioned and shaped on long production runs. The quality of the product is assured; rejects are virtually eliminated.

All operator does is put pipe in die and a limit switch is automatically triggered, driving hydraulic cylinders inward to perform four dimpling operations simultaneously.

The hydraulic system was designed with the aid of Rucker Company field engineer Jim Ayers, and the equipment was built by the Rucker Co. Economy was effected by designing a single hydraulic unit to serve the two dies. It is estimated that the hydraulic equipment cost 1/3 less than a mechanical system.

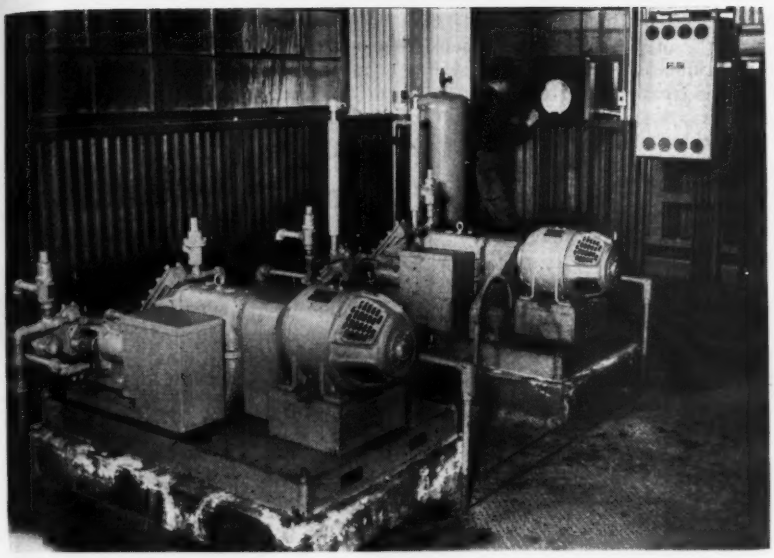
Water conditioning made automatic with variable speed drive

case history 23

Automatic control has replaced manual methods for conditioning water flowing into the paper making process at Fibreboard Paper Product's San Joaquin pulp and paper board mill. Two electronic variable speed drives have relieved pump house operators of the responsibility and time involved in adding and constantly adjusting the amount of conditioner in the incoming water.

To do away with manual conditioning Fibreboard Paper Products Corps. installed two Thy-Mo-Trol drives on its conditioner pumps. A flow meter in the main water line equipped with suitable torque-multiplying linkages so that it would turn the speed adjusting potentiometer in the control circuit of the Thy-Mo-Trols in accordance with variation in water requirements. The amount of conditioner is directly proportional to the amount of water being used and the control operates to provide constant water conditioner within close limits.

After conditioner is added the water goes to a large flocculating tank where organic materials settle to the bottom. Water going into the mill is taken from the top of this tank and,



Only routine checking is required in this water conditioning operation since conditioner pumps are powered by automatic and electronically controlled variable speed drives.

regardless of river conditions, is suitable for the paper process.

Although these General Electric drives operate from a standard three-phase a-c. circuit, they provide the precise control associated with direct current drives. This is accomplished by electronic tubes which convert a-c. to d-c. and provide direct current motors on the conditioner pumps with proper current at the voltage called for by the flow meter.

Two over-running clutches solve tough drive-change problem

case history 24

Two over-running clutches played a major role in the design of a machine for processing corrugated boxes twice as fast as previously existing systems. Developed by H & C Engineering Co. in Sunnyvale, Calif., the Equalok Folder-Gluer cuts, creases, folds and stacks boxes at an average rate of 10,000 per hr. But, in addition to speed, the machine reportedly provides lower spoilage and rejection rates than ever experienced before.

Facing W. J. Hottendorf, H & C principal who developed the machine, was a gluing mechanism problem. One of the requirements for successful operation of the entire machine was that the glue wheel, which coats the box seams, be rotated continuously as long as there was glue in the pot.

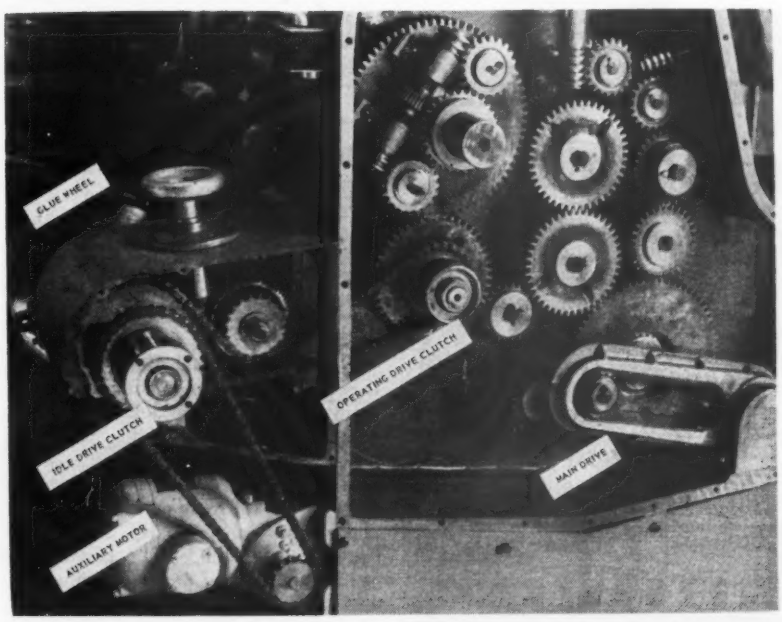
This is necessary to agitate the glue and keep it from settling or losing desired consistency. Also, should the wheels stop even for a few minutes, the glue exposed to the air would dry, cake and gum up the mechanism. A drive set-up that would run the glue wheel off an auxiliary motor when the machine itself was idled, but which would allow the main drive to take over instantly when it was turned on, was needed.

The problem was solved with a carefully thought-out application of two Formsprag clutches. Electrical switches are arranged in such a manner that a 1/3-hp. motor cuts in to stir the glue pot when the main power is turned off. This is an 84-rpm. motor, geared at a 2:1 ratio, turning the wheel at 42 rpm—four or five times slower than when the machine is in full production, but serving its purpose adequately.

Change of power source is handled through the use of two over-running (often called "free-wheeling") clutches, each consisting of a full complement of sprags inserted between an inner and outer race. The sprags are controlled so that they are in constant engagement by the use of two garter springs, and concentricity is maintained by the use of either sleeve or ball bearings.

When the main power source is either idling or completely shut down, the gear motor transmits power to the outer race of the clutch, and, through the sprags, to the inner race, to rotate the jack shaft, which mounts a larger sprocket. The gear motor transmits its power to the outer race of the clutch through a chain drive and sprocket attached to the outer race.

The jack shaft in turn causes a second chain drive to rotate the glue



Glue wheel must turn continuously in this box machine or glue will dry. Trick was to power it from one source while machine was operating and from a slower source during idle time. Installation of two clutches as shown here solved the problem.

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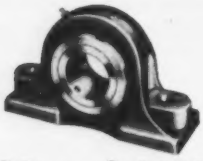
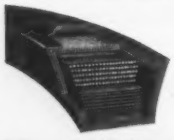


SC and SCM
BALL BEARING
PILLOW BLOCKS



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3. SEALED-LIFE V-BELTS. Construction details and data on sizes, pitch lengths and outside lengths. Bulletin A-606.

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mechanism. During this portion of the cycle, the main drive of the machine is stationary, because the second clutch is free wheeling.

During normal operation, the gear train drives through the second clutch (in the same manner as described for the "idle drive" clutch) and causes the second roller chain to continue to rotate the glue mechanism. During this condition, "idle drive" clutch is free wheeling, so that the main drive does not attempt to transmit power back through the gear motor. This over-running feature is essential, because the gear motor otherwise would be transformed into a speed increaser, and would cause failure on that drive. The machine main drive operates at regular running speed of 200 or more rpm.

Thus, the Equalok's gluing mechanism is in a state of moving readiness, ready to follow instantly every operating impulse of the complex machine. Its ability instantly to accept alternative drive sources is one of the important keys to this new dimension in corrugated box manufacture.

Production gains and operating cost reductions achieved by change to electric motor drives on these viners seemed impossible until a compact drive beat a space problem.

Compact V-belt drives make 75% cut in operating costs possible

case history 25

Operating costs have been slashed by 75% and production boosted 10% at Lamb-Weston's pea freezing plant in Weston, Ore., by changing the drive set-up on viners from gasoline engines to electric motors. Key to "electrification" of the viners was compactness of the drive system used.

During the annual 60-day harvesting season the viners remove peas from pods on vines delivered from nearby fields on a 24-hr. per day basis. Driven by gasoline engines with a standard belt drive on each, the viners were the root of high maintenance costs and excessive down-time Furthermore, each engine had to be overhauled, stored and remounted in the spring every year. This cost Lamb-Weston about $60 per engine.

Because threshing speeds were affected by moisture content of the vines, Lamb-Weston investigated the possibilities of using variable speed electric motors instead of the gas engines. The idea was that automatic adjustment of drive speed to meet fluctuations of moisture content in the vines being processed would speed the operation and probably do away with the high maintenance cost experienced. However, the cost of variable speed motors for the vast number of viners involved was prohibitive.

Consulting with a near-by Gates Rubber engineer, a more economical method of achieving the same results was determined. A system was designed involving standard electric motors and variable speed sheaves and V-belts. Gates Super Vulco Ropes were selected, according to the Lamb-Weston engineers, because their 40% additional power capacity provided a more compact drive in the limited space available. To date, 46 of the viners have been "electrified."

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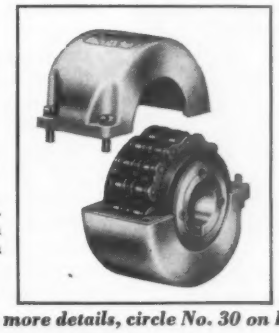

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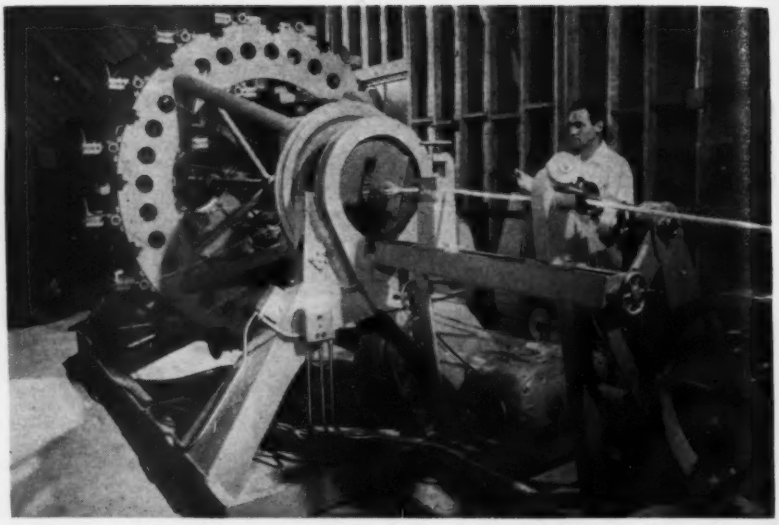
Variable speed is key to 48-bobbin cabler operation

case history 26

A variable speed drive is the key to changing cable spinning pitch necessary to operation of the 48-bobbin Douglas Variable Pitch Planetary Cabler designed by and being used at Douglas Roesch, Inc., of Los Angeles. Electronic cables—some so small they must be viewed through a magnifying glass and others as large as a man's wrist—are produced by this intricate piece of machinery.

Cables produced range from fragile strands of conductors to delicate coaxial circuits. Cable pitch on the machine can be varied from a ratio of one turn in length equal to four or five cable diameters, to more than one turn in 15 diameters.



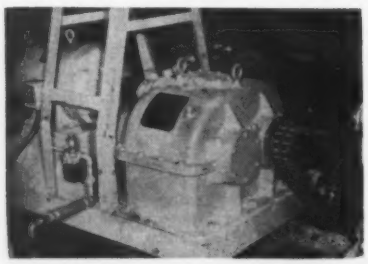
Important pitch changes in this cable spinning machine are handled by a variable speed drive with input speeds ranging from 23.2 to 173 rpm., output speeds from 9.4 to 423.8 rpm.

Drive for the cabler is a Link-Belt PIV 6:1 ratio unit with standard shaft extensions. The input shaft is variable speed operating at 23.2 rpm. minimum and 173 rpm. maximum. The output shaft's speed ranges from 9.4 rpm. to 423.8 rpm.

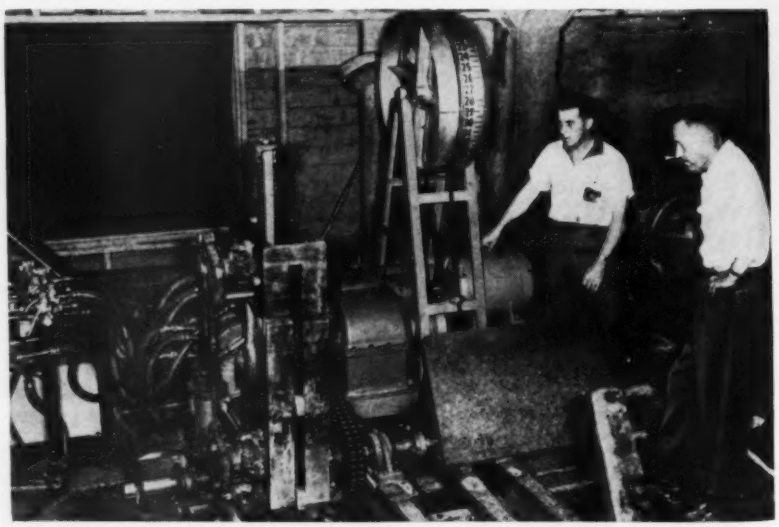
Gear box helps one operator do work of three

case history 27

A new set works system developed by Mill Equipment, Inc., of Seattle, Wash., is bringing automation and cost reductions to sawmills. With the system, one sawyer by push-button control pre-sets highly accurate cuts to be made in a log, as opposed to days past when it took two or three men to do the job. One of the keys to the system's operation is a special gear box for the sawyer-controlled set works headrig, designed and manufactured for Mill Equipment at the Seattle Works of Western Gear Corp.



Forward or reverse power is immediately available to sawyer operating set works equipped with gear box like this one.

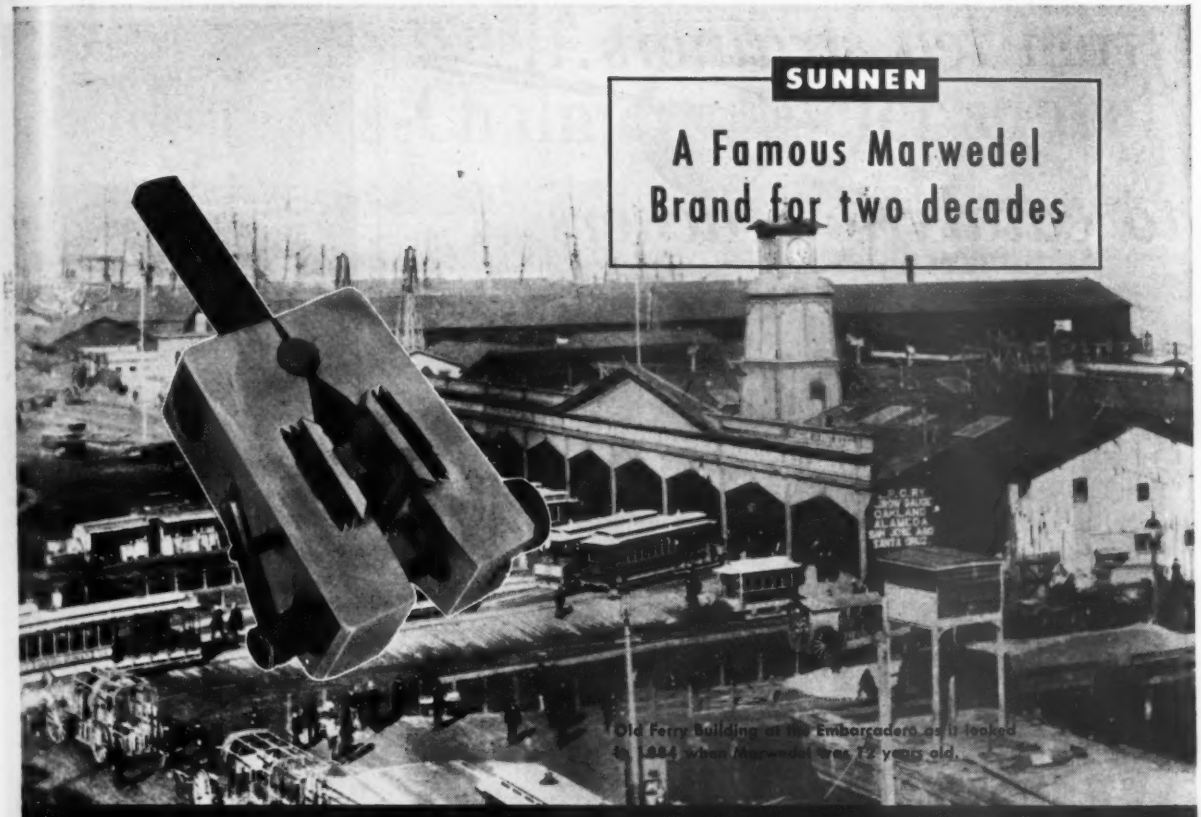


The new set works system that is producing Western sawmill manpower savings is examined here by Roger Carlson of Potlatch Forests and Jim Wells of Mill Equipment, Inc.

The special gear box, composed of helical and herringbone gears, has one input shaft, two intermediate shafts, and one output shaft. This arrangement assures continuous operation to the motor, with power immediately available in either forward or reverse direction. With a 1,200-rpm. motor, the output speed in the forward or "set" direction is 30 rpm.; 90 rpm. in the reverse or "recede" direction. The unit is rated for use with 7½, 10, or 15 hp. input. The forward and reverse gear trains are actuated by 6-in. and 8-in. air clutches respectively,, mounted externally on shaft extensions. This arrangement allows the motor to run continuously and full motor horsepower is thus available instantly for driving either shaft.

A 6-in. air brake stops the motion of the log load and the gears within .004 in. movement of the log. All clutches and brakes are mounted on tapered shafts on the motor side for ease of maintenance.

First two 10-hp. installations of this system are at Potlatch's Coeur d'Alene and Lewiston, Idaho, sawmills, with installations at other mills planned.



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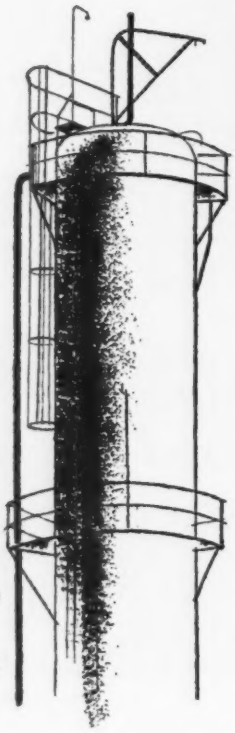

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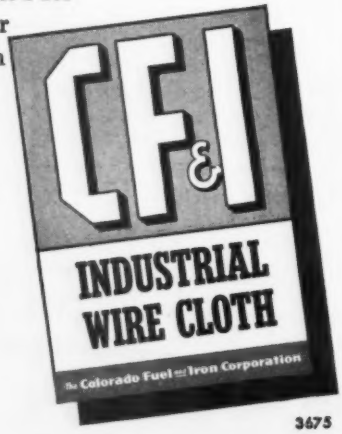

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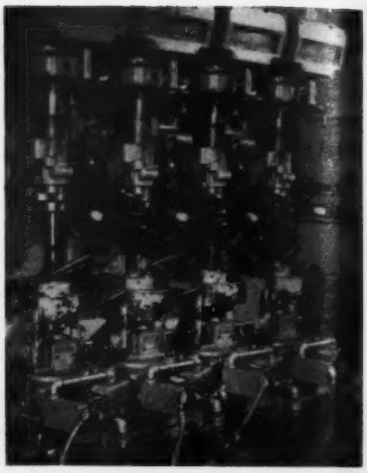


Smooth controllable action on drill traverse in this air-powered set up has increased efficiency of drilling four 11/16-in. holes in close-tolerance steel plate parts.

Less spoilage, 50% more output with air-powered drilling

case history 28

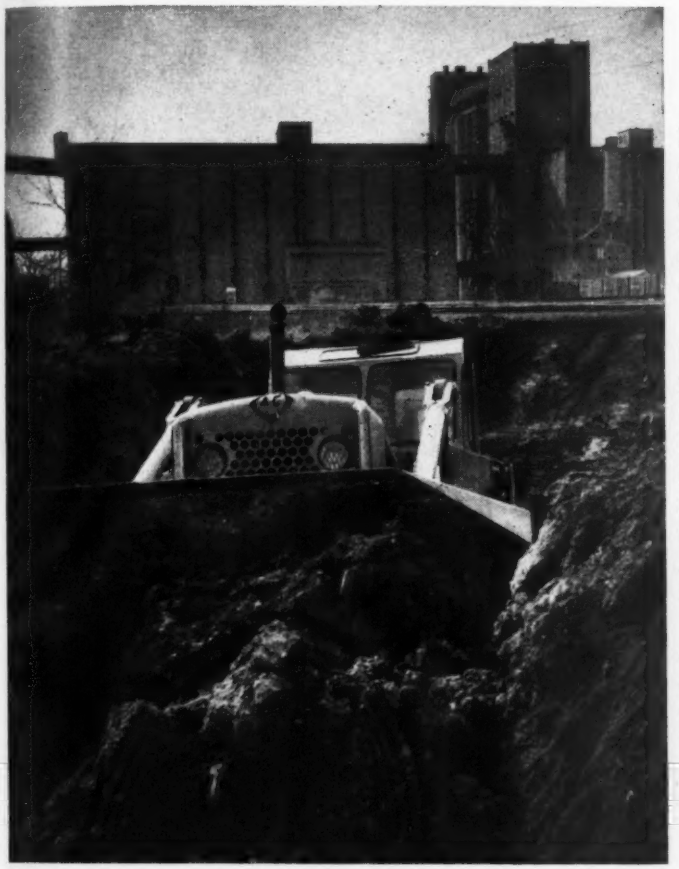
An air-powered drill press has reduced spoilage and tool wear and improved the quality of punched steel plate at Hycon, Oedekerk and Ludwig, Pasadena, Calif., custom machining organization. The accuracy and "controllability" possible with the controlled air power system have also boosted by 50% production of thousands of these close-tolerance parts.

Before controlled air power was used for drilling four 11/16-in. holes in 1,020 steel plate in a close-quartered counterbore, a semi-automatic drill press cut the holes through the steel. The geared power take-off was difficult to regulate and spoilage and toolwear were high. The parts were also hand fed to the drill table.

The new set-up, with four Bellows drill press feeds and Hydro-Checks on a four-spindle drill press, gives smooth controllable action to the drill traverse. Four Bellows rotary feed tables bring the parts into exact position in timed sequence, while a microswitch halts the action after the last hole is drilled so that the part can be removed and a new piece loaded.

The designing and wiring of the whole operation were relatively simple and since installation there has been no interruption in the continuous operation of the machine.

Staley solves waste disposal problem with an Allis-Chalmers tractor shovel



Adopts highly successful landfill system

Most plants have one by-product and one problem in common. The by-product is waste and the problem is how to dispose of it. Staley Manufacturing Company, Decatur, Illinois, disposes of both the waste and the problem with an Allis-Chalmers HD-11G tractor shovel.

By adopting the sanitary landfill system, this large manufacturer of soybean and corn products now disposes of refuse quickly and cleanly. There are no unsightly dumps . . . no hillside "smudgepots" . . . no breeding places for insects and rodents. Further, the system requires a minimum of man power and equipment. This picture story describes how one Allis-Chalmers HD-11G tractor shovel handles Staley's three-step landfill operation.

• • •

This versatile machine can help solve your waste disposal problem—and double as a material handling and yard maintenance machine. Write for free literature on all four sizes of tractor shovels from 1½ to 4 cu yd, or see your Allis-Chalmers construction machinery dealer.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION,
MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

Cuts the trench. The first step in Staley's landfill system is to cut a trench. Their Allis-Chalmers HD-11G, with 111 net engine hp and a large-capacity hydraulic system, easily handles tough excavating. It is also mobile enough to carry excavated material to conveniently located stockpiles.

Spreads and compacts refuse. A truck dumps refuse at the head of the trench. The HD-11G then pushes or carries refuse with the bucket and spreads it in the ditch. Utilizing its 32,000 lb of weight, the crawler tractor compacts the material to a small fraction of its original volume.

Seals it in forever. At the end of each day, the tractor shovel takes dirt from stockpiles—2¼ cu yd at a pass—and spreads it over compacted refuse, leaving smooth, clean, level land. In many cases, useless lowlands have been reclaimed by the landfill system and later put to valuable use as playgrounds or building sites.

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Here's Lufkin

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3. MUVAZENE AĞIRLIĞINI İLÂVE EDERKEN YOLLARI VE YARIKLARI TEMİZLE. MUVAZENE AĞIRLIĞININ EMNİYET PARÇASINI İHTİVA EDEN UCU KRANKIN UZUN UCUNA DOĞRU OLMALIDIR.
4. ÇALIŞTIRMAĞA BAŞLAMADAN EVVEL MAKARA VE FREN KAMALARI İLE KRANK PİMİ SOMUNLARINI İYİCE SIKIŞTIR.
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PACIFIC COAST DIVISION, 5959 South Alameda, Los Angeles, Calif.

A 75% cut in charging time is provided by this electric-hydraulic powered plywood production lathe charger. When lathe drops core of one block a new one is aligned automatically.

Electric-hydraulic power helps boost log peeler accuracy 400%

case history 29

New automatic machines are supplanting manual labor for routine operations in the manufacture of plywood, with the results being a general up-grading of the in-plant labor force and a net decrease of manufacturing costs. In the past, plywood manufacturing has entailed a long succession of slow sorting and positioning operations, causing work interruptions at every stage of manufacture. A good example of how engineered automation is changing that picture is provided by examination of the "Veneer Lathe Charger," manufactured by Ederer Engineering Co. of Seattle, Wash., with the story of the machine's design and operation provided herewith by C. W. Newman, Northwest branch manager at Seattle for Vickers Incorporated. The machine's hydraulic-electric power application and close control combine with pre-positioning the peeler log or block to cut actual charging time by 75% while increasing precision about 400%.

The quality of veneer and the production rate of the lathe dictate the utilization of the entire plant facility. Now, one man can pre-position with greater accuracy than could two men using conventional sling hoists, positioning each peeler directly to the lathe chucks. Machine down-time for reloading is reduced from about 20-30 sec. to a uniform 8 sec.

Pre-positioning is accurate to within one-half inch or less. This must be compared to the traditional limit of about two inches on accuracy that can be achieved without increasing reloading time beyond the 30 second figure. Precision means high veneer quality. The gain in lathe output is an extra bonus.

Peeler blocks (debarked logs trimmed to uniform length) of varying growth structure and sizes are rolled into position ready for pickup, one at a time, by the charger. End clamps are driven into the ends of the block through a worm and traveling nut mechanism. A Vickers vane type hydraulic motor rotates the worm.

The block is lifted and its ends maneuvered in mid-air independently of one another, to position the block axis parallel to and at the exact height of the line of centers of the lathe chucks. This pre-positioning is ingenious but simple. Lights beamed onto each end of the block are the bull's-eyes. The two light sources are fixed to cast their beams along a

GEARS FOR INDUSTRY
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OIL FIELD PUMPING UNITS

GOONEY BIRDS AND CRYSTAL BALLS

V. J. Fawcett

Gooney Birds of The South Pacific are famed for their ability to fly backwards. Some say this is so because they don't care where they're going—they only want to see where they've been!

Unlike The Gooney Bird, we always want to see where we're going, and with a brand new year ahead, it's fun to look into our crystal ball for a peak at '57. But, first, we'd like to fly backwards awhile, and join with us, if you will, to see where Lufkin has been.

Highlighting events of 1956, Lufkin proudly points to these developments:

NEW—Lufkin delivers to California, world's biggest oilfield gears, rated at 1,500,000 in. lbs. peak torque, for 16 ft. stroke air-balanced long stroke pumpers. Gear boxes are 9 ft. long and 6 ft. high, and weigh 24,000 lbs. each. Installed on Union Oil of California well at Santa Fe Springs.

NEW—Lufkin delivers to Central and Southern California seven 1000 H.P. High Speed Gear Increasers for new Union Oil of California Pipeline—Coalinga to Oleum, California. Ultimate capacity, 150,000 B/D.

NEW—Lufkin delivers to Gold Beach, Oregon, first three Heavy Duty Double Reduction Gear Reducers for new U. S. Plywood Corporation plant.

NEW—Lufkin delivers to Portland, Oregon, first four Heavy Duty Double Reduction Gears for Beale Steel Pipe Rolling Mill.

NEW—Lufkin delivers to Japanese waters first Marine propulsion drives for Caterpillar diesel engine driven barges for service in Gulf offshore drilling.

These and many other new developments mark Lufkin progress in 1956. Thanks to the continued and growing acceptance of Lufkin geared products everywhere, and thanks to the patronage of thousands of enthusiastic and satisfied customers, coast to coast, we are all indeed grateful for another banner year.

From each and every one of us to each and every one of you, A Happy and Prosperous 1957!

Lufkin FOUNDRY & MACHINE COMPANY

← . . . for more details, adv. opp. pg., circle No. 34 on Reader Service Postcard

single line. The peeler block axis is located on this line when both light beams are intercepted at the center of the growth rings. The operator observes one intercept directly, the other in a mirror, and adjusts each end horizontally and vertically to obtain correct positioning.

Vertical hydraulic cylinders lift the ends to the correct elevation. Horizontal cylinders position the block axis in a vertical plane parallel to the plane of the lathe chuck centers. Vickers solenoid operated directional valves control the maneuvering cylinders as well as the hydraulic clamping motor. Speed control of all cylinders for rapid motion or fine positioning is obtained with a single Vickers manually controlled metering valve.

An electric or hydraulic motor drive moves the loaded charger along overhead tracks into exact chucking position, at which time the lathe chuck engages the peeler block. The clamps are withdrawn and the charger immediately returns to start another cycle. Both lathe and charger are ready to go back to work, also without any delay.

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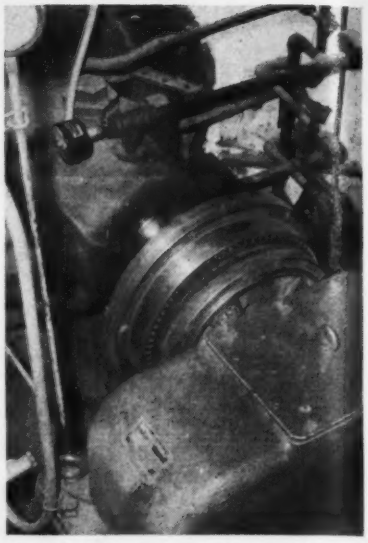


Air is fed to clutch on steam turbine unit through hollow drive shaft.

Air clutch solves lumber mill power change-over problem

case history 30

A powerhouse problem that has long vexed Western lumber mills —and plants with a similar need for steam power—is a method for connecting a standby steam turbine to an induced draft fan quickly if the electric motor drive should fail. Roseburg Lumber Co. in its Roseburg, Ore., mill has solved that problem and reduced down-time involved in the power change-over.

The drive involved powers an induced draft fan in the mill's boiler. On one end of the fan shaft is a GE steam turbine and a speed reducer; on the other end is a 300-hp., 900-rpm. electric motor. The electric motor is connected to the fan shaft by a flexible coupling and is the primary source of power.

Normal couplings have never provided satisfactory disconnect features for the steam turbine side of the drive. The set-up in use now involves the use of a Dodge Air-grip clutch as a cut off coupling between the shaft from the turbine speed reducer and the induced draft fan shaft.

Using the air-actuated clutch presented a design problem because the clutch was mounted between two shafts rather than at the end of a shaft as in normal mounting procedure. Usually, the air is fed to the clutch

. . . for more details, circle No. 35 on Reader Service Postcard

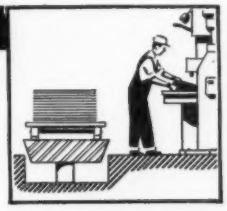
FOUR WAYS TO CUT MATERIALS HANDLING COSTS

CASE HISTORIES SHOW HOW TO USE "LIFT-PORTATION" FOR TRUCK LOADING, MACHINE FEEDING AND HEAVY LIFTING

By John R. Queen
Vice President and General Manager

To maintain profits in the face of the rising costs of our expanding economy, economists forecast the need of a 3% increase in productivity per man each year. Because manufacturing consists largely of movement of materials, a study of material handling methods will indicate many clues to sources of this increased productivity.

MACHINE FEEDING

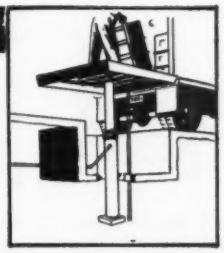


In Washington, D. C., a large printing company studied the manual stoop . . . turn . . . lift . . . twist required to remove paper stock from a skid and place it in position on a power-driven paper cutter.

To speed the operation, the skid is now placed on a Globe Production Lift installed alongside the paper cutter. Manual lifting is completely eliminated. The operator, by push-button control, raises the paper to cutting table level and slides a heavy load of paper under the blade with little effort. As the paper level goes down, the platform is inched upward.

Production increased approximately 30% after installation of Globe Lift.

TRUCK LOADING

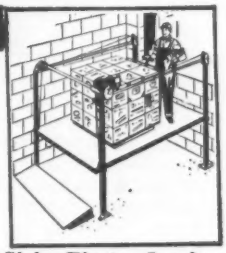


A one-story ground level branch warehouse and service station was faced with the frequent need to load and unload fork lift trucks, weighing from 1½ to 8 tons. Without a loading platform, each operation was slow and hazardous.

When a Globe Loading Lift was installed, fork lift trucks were run onto the platform at ground level, lifted and then run onto the truck.

Loading and unloading that previously took hours is now completed in minutes.

ELECTRO-LOADER



A maintenance department in a medium size plant was located 3 feet below ground level. Supplies and machines moved into and out of the department by means of a ramp. It was slow, laborious work.

By replacing the ramp with a Globe Electro-Loader, traffic was speeded and muscle power was eliminated.

The Electro-Loader is installed on the floor. No excavation was necessary. Powered by an electric motor, the platform travels between floor and ground level by push-button control.

TRANS-O-MATIC RAMP

The shipping dock of a large paint factory in Buffalo, N. Y. was continually jammed with trucks. Often trucks waited to load and unload. While the dock was "standard" height above road level, most truck bodies were too high or too low for hand trucks to roll smoothly in or out.

Three self-leveling Trans-O-Matic Ramps were installed so that each truck bed, high or low, was provided with an easily traversed ramp. Loading and unloading was speeded by as much as 50%. Lost time from spilled goods and breakage was eliminated. No longer do trucks wait for platform space.

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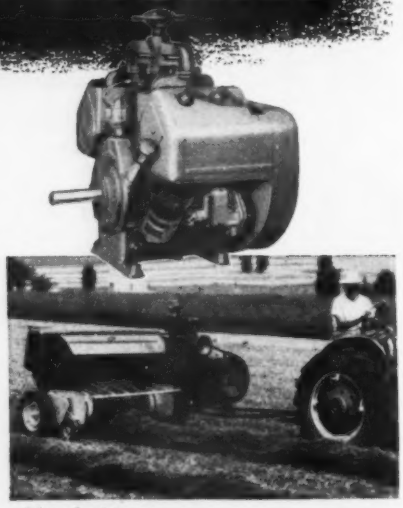
When you specify Wisconsin Engine Power your good judgment is backed by over 2,200 Wisconsin Authorized Service Stations in the U.S. and Canada and in 82 foreign countries. Write for "Spec." Bulletin S-195 and tell us about your power problem.



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through the outer side of the unit. The problem was solved by using a hollow shaft in the speed reducer to which one side of the clutch is connected. The air is fed through the speed reducer shaft into the clutch.

Magnetic amplifier speed control cuts maintenance costs

case history 31

Elimination of clutches through use of a magnetic amplifier for speed control has cut maintenance costs in a label-slitting operation at Avery Adhesive Label Corporation, Monrovia, Calif. Avery designs and builds its own equipment for this operation, which permits low-cast, high-speed slitting of wide rolls of labels into rolls one label wide.

Avery developed its own slitting equipment, utilizing ordinary razor blades as knives. An uncoiler reel holds the wide roll. A powered rewind reel pulls the wide strip down over a flat inspection surface, past a counter which records strip length, past the knives, and then rolls up the resulting single-label strips. Top speed is 716 fpm., giving a yield of nearly 2¾ mi. of labels per minute when slitting rolls 20 labels wide.

To enable the operator to slow the label's speed for close inspection when necessary and start or accelerate slowly and smoothly to high speed without tearing the strip, a variable speed drive is necessary. Originally, the type of clutches used in sewing

Wind-up speed is set by pedal on this variable speed label machine. Magnetic amplifier control unit fits neatly under table.

"SWITCH!" said Ostuco

. . . and savings were surprising!

Pleasant surprise, too! Bearings Company of America, Division of Federal-Mogul-Bower Bearings, Inc. Lancaster, Pa., was machining OSTUCO seamless tubing to make a clutch release bearing collar used as original and replacement equipment. Results were fine!

Then word came from OSTUCO, recommending a switch to OSTUCO's newly developed NP-60, tubing specially processed for machineability. Cost was slightly higher, but BCA and OSTUCO engineers predicted the savings would justify the change.

they switched . . .

. . . and they SAVED!

	Regular	Specially Processed NP-60
Production per 8 hour shift (units)	675	840
Production time per 1000 units (hours) . . .	12.35	10.03
Total Labor per 1000 units (man-hours) . .	13.09	10.63

Besides the savings, Bearings Company of America was pleased with the better finish of the new part. They point out that the collar in photo above "shows the finish as it comes directly off the machine."

It happens this way often enough to warrant checking with OSTUCO about your tubing applications and production problems. Contact your nearest OSTUCO Sales Engineer or write direct to the Shelby factory —there's no obligation!

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machines provided this speed control.

Now, Avery has several machines powered with Clark Controller packaged variable speed drives which incorporate motors with magnetic amplifier control. Magnetic amplifiers, having no moving parts, require no adjustment or other maintenance.

The speed control rheostat is connected to a pedal, with which the operator can vary speed at will. When the pedal is at the upper limit of its travel, it shuts off power to the drive.

Tension control is required, since without it the inertia of the uncoiler could cause it to feed the strips of labels faster than the rewind was rolling it up, whenever the drive was slowed. Therefore, a solenoid-operated brake is also connected to the pedal, and is adjusted so that in its released position it still exerts a slight drag on the uncoiler—enough to maintain tension during minor speed changes. When the pedal is released, which shuts off power and results in rapid slowing of the rewind, the brake is automatically set, thus causing rapid slowing of the uncoiler to continue to maintain tension.

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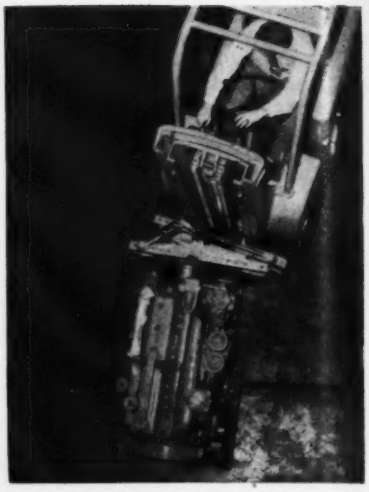


Lift truck attachment is hydraulically operated to help driver position load.

Hydraulic hose is built-in cost cutter on lift truck unit

case history 32

By using a hydraulic hose that can be replaced quickly and which requires very little stocking of replacement parts, Swing-Shift Manufacturing Co. in Longview, Wash., has provided the users of its lift truck attachment a built-in cost reduction.

The Swing-Shift lift truck attachment is a production booster itself. Adaptable to most standard lift trucks, it enables operators to maneuver loads through narrow aisles and crowded areas and swing the load in a lateral arc independent of the lift truck itself. Thus, when the truck has made an awkward approach, the driver need not repeat the maneuver to center the forks properly under the load. The Swing-Shift can be positioned at the proper angle.

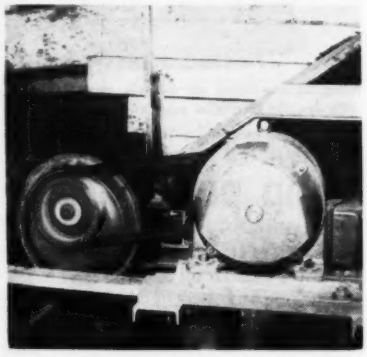
Hydraulically operated, the lift truck attachment uses Aeroquip Single Wire Braid hose for fluid lines. To avoid chafing and flexing actions presented by the Swing-Shift's lateral movement, the lines are looped over pulleys on the lifting arm of the lift truck. Additional lines connect hydraulic units of the attachment's power mounted between the forks and the truck. All hydraulic assemblies are medium pressure types with high operating and burst pressures. Operating pressure is 2,000 psi.; the hose assemblies have a maximum capacity of 8,000 psi.

Conveyor downtime slashed by new drive and overload release

case history 33

New drives and installation of an overload release have drastically reduced down-time, made available more space, cut fire hazard, and boosted production on two problem conveyors at Nettleton Timber Co.'s Seattle, Wash., plant. Prime problem-causer was this plant's main refuse conveyor, which carries lumber scrap away from the machinery. Operating from a jackshaft friction drive, the conveyor's drag chain broke frequently due to heavy load shocks experienced.

Further trouble was caused from grease that was thrown from the friction gears creating a fire hazard. The drive set-up that solved the problem is composed of American Pulley components. A Shaft-King speed reducer driven by Wedgtite sheaves and



Two problem-conveyors, when equipped with new drive set-up, no longer break down due to heavy shock loads or throw grease, causing fire hazards. Production went up also as a result of the drive changes.

Wedgebelts and powered from a 20-hp. motor operates the drive at 116 rpm. An American overload release protects the drive against load shock damage. The fire hazard was eliminated and replacing the jackshaft drive released valuable floor space.

Space saving on the second conveyor drive to be replaced was so great that Nettleton was able to install new debarking machinery. This conveyor is a secondary refuse conveyor which carries sawdust and debris away. New drive consists of a Shaft-King reducer operating at 116 rpm. and driven through Wedgtite sheaves and Wedgbelts from a 30-hp. motor.

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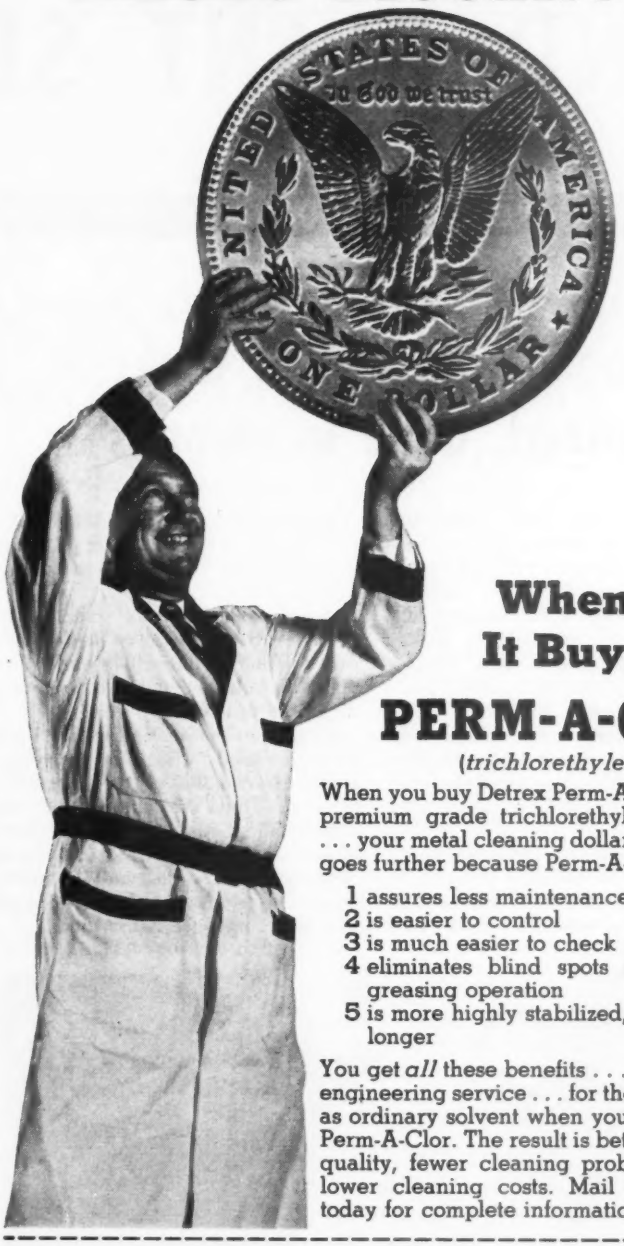

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MAINTENANCE METHODS AND PLANT SERVICES

Cleaning of glass-lined tanks mechanized, done in seconds

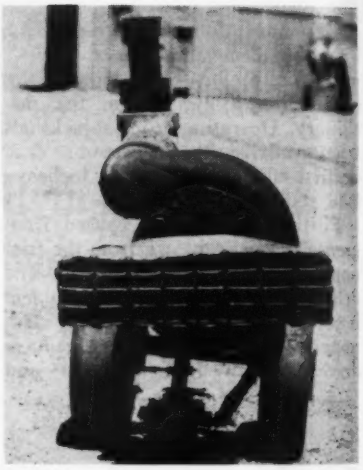
case history 34

Using blast cleaning equipment has enabled Hamm's Brewery in San Francisco to reduce spot cleaning of its glass lined tanks from a 25 to 30-min. by-hand job to a mechanized matter of seconds. Use of the blast cleaning equipment also provides a cleaner surface than was obtainable by hand cleaning methods. Thus filling in the spot and refinishing the lining is now more effectively accomplished.

Providing these savings for Hamm's is a Clemco Educt-O-Matic manufactured by Clementina, Ltd. A sheet of rubber is used to mask the area to be blasted. A hole is cut in the rubber the size of the area needing cleaning. Maximum size of cleanable area is 1¼ in. diameter. The Educt-O-Matic, weighing only 10 lb. even when loaded with abrasive, is then placed over the hole in the rubber mask. The operator pulls the unit's trigger and the job is done.

The blast cleaning unit recovers the abrasive used when the operator places the handle in the "suction" position. Thus the abrasive is not sprayed about and dust is no problem. Hamm's uses steel grit 80 mesh as a cleaning agent. The unit requires from 33 to 60 cfm. of air operating at 80 to 90-lb. pressure.

Spot where tank shows wear is blasted down to bare metal in a matter of seconds, where hand cleaning previously required 25 to 30 min. By placing handle of the unit in suction position, abrasive used in operation is recovered so dust is no problem.



Pump is mounted on wheels and equipped with special intake to suck up sediment.

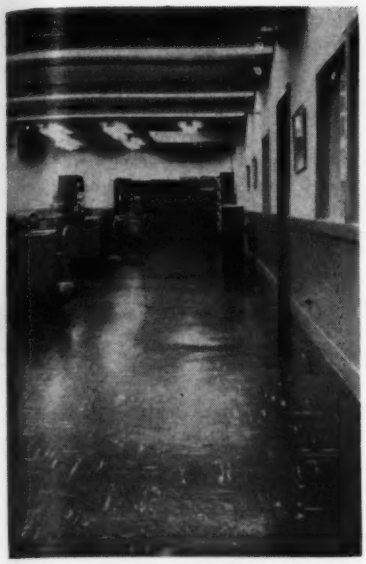
Sump pump cleans cooling tower basins fast

case history 35

A savings of 375 man hours—at $2.50 per hr., it adds up to $4,687 per year—has been realized at a large California chemical plant in the cleaning of each of five 100 x 500-ft. cooling tower basins. The job, now done by sump pump, formerly required 500 man-hours per basin.

Sand and sediment must be removed from the basins once a year. Using an Ingersoll-Rand sump pump mounted on wheels and equipped with a special intake to suck up the sand and sediment, the operator walks along the basin pushing the pump in front of him like a vacuum cleaner.

Another worker guides discharge and air hoses. As the air hose floats on the surface on the water which is only 4-ft. deep, this worker can easily keep up with the pump operator.



This floor in aircraft plant office area needed no elbow grease to get its gloss.

Floor care costs down 30% with buffless polish

case history 36

A high-gloss polymer resin emulsion floor polish that requires no buffing has polished off floor maintenance problems for two major Southern California aircraft plants, and reduced floor care costs by 30 to 50%. The buffless floor care possible with the new non-wax polish, introduced early last year, has solved the three-pronged dilemma of floor maintenance men—appearance, safety, and cost.

Previously, at both plants, the good appearance of high gloss was obtained by waxing and buffing, but this also created slippery floors and continual injuries from slips and falls. Buffing time was eating up maintenance dollars too. By eliminating the need for buffing, reducing daily maintenance needs, prolonging the period between floor stripping, and increasing safety underfoot, the new Columbia Wax Co. polish has been a welcome cost reduction boon to these plants with their large floor areas.

At Northrop Aircraft's plant in Hawthorne, Calif., Joseph C. Gillibrand, general foreman of plant engineering, adopted the buffless method for much of the plant's flooring after a thorough test on a 600-ft. hallway in the company's executive building, about which management and company personnel had frequently complained. To date, Gillibrand reports a perfect safety record, with no falls or injuries due to floor condition, and says that elimination of buffing on some 300,000 sq. ft. of asphalt tiling without reducing the quality of floor maintenance makes it easier for his crews to keep up with increasing work

At the Rohr Aircraft plant in Chula Vista, Calif., Virgil Thurman, janitor foreman with a staff of 33, was one of the first to adopt the buffless method when he tested the Columbia Safe-Guard polish on a wood floor and an asphalt tile floor in the Rohr general office building. The tile floor presented a special safety problem: girls stepping off adjoining carpets had a high accident rate from slipping. High anti-slip rating of the new wax came in handy there. Thurman reports a reduction of 50% in manhour costs per sq. ft. of flooring, chiefly by the elimination of buffing, but also because floors are easier to maintain and do not have to be stripped as frequently.

LP-gas stand-by plant reduces fuel costs $8,000 per year

case history 37

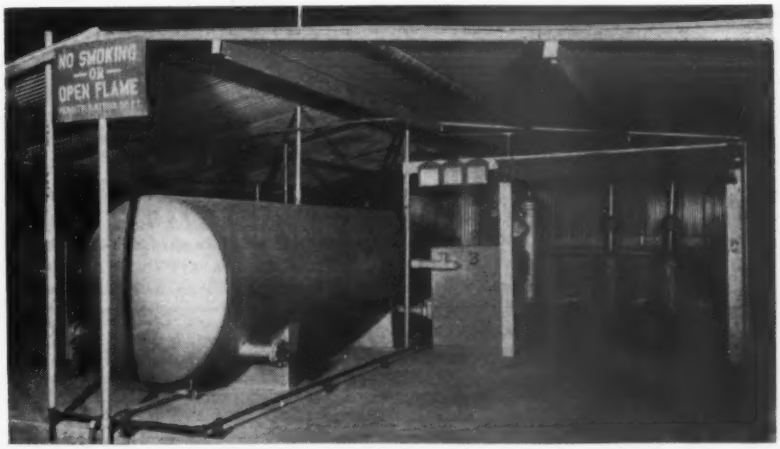
By increasing the size of its LP-Gas stand-by plant so that propane can be used to satisfy 75% of its fuel requirements, Pomona Tile Manufacturing Co. is saving $8,357 annually in cost of fuel. The stand-by system is operating seven bisque and glaze tunnel kilns and two smelting furnaces, which use 48 gal. of fuel an hour to produce daily 1,000 lb. of frit for liquid glaze.

The increased stand-by capacity has enabled Pomona Tile to buy its monthly 15,695,550 cu. ft. of natural gas from Southern Counties Gas Co. under an interruptible gas rate contract, which provides the company with substantial savings over its former firm rate contract. The $8,000 figure represents the difference between the cost of natural gas on a firm rate contract and the cost of all stand-by fuel.

The ceramic tile firm, which started operating in Pomona, Calif., in 1923 with two small kilns, today produces more than 35,000 sq. ft. of tile daily in 19 tunnel kilns operating on a 24-hr. basis. In 1943 Pomona Tile installed its original LP-Gas stand-by plant to help decrease costs.

The present stand-by plant, whose capacity was increased in 1955 by American Liquid Gas Corp. in Los Angeles, the same firm which made the then existing installation, incorporates three LP-Gas mixers, each with a capacity of 10,000 cu. ft. per hr. The LP-Gas system, which supplies replacement gas with a calorific value of 1,500 Btu., is supplemented by diesel fuel and kerosene.

In addition to the direct financial savings, indirect savings have resulted from the enlarged stand-by system. Uninterrupted operation has been assured at all times so downtime and lost production are not problems, and there is no equipment damage or lost product due to inconsistent burning.



Mixed gas rectifier with 500-cu. ft. capacity and a 50-lb. working pressure in accordance with ASME code is part of the LP-gas stand-by plant at Pomona Tile Co.

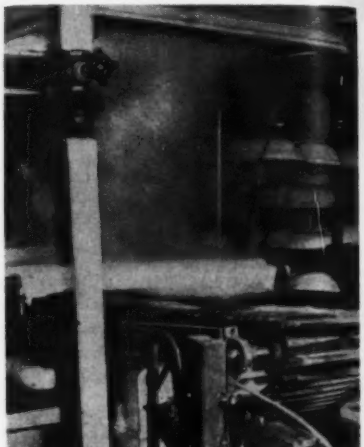
Valve replacement costs cut in steam throttling service

case history 38

Costly downtime for valve replacements has been eliminated and valve maintenance reduced to a fraction of former frequency through a lengthy testing of a new valve at Jantzen, Inc.'s woolen mills in Portland, Ore. Faced with heavy-duty steam throttling services ranging up to 250-300-deg. F. at 125-lb. pressure in its shrinking and dyeing operations, the plant was reconciled to replacing non-metallic valve seats on an average of once every few months.

The focal points of steam's tornado-like force in textile plants are the seats and discs of valves. At the critical points, where the regulation of steam flow takes place, the force is so concentrated that in a short time—depending on temperature, pressure, and frequency of throttling—it produces "wire-drawing," minute channels that permit the escape of steam even with the valve closed tightly. Once wire-drawing starts, the valve seat and disc deteriorate rapidly.

Jantzen plant operators made a trial installation of Lunkenheimer LQ600 bronze globe valves with Brinalloy



A ½-in. metering valve with seat and disc of a tough new alloy has stopped down-time for a year on high pressure steam line.

seat and disc about a year ago. The difference in this valve lies in the use of Brinalloy NS8, a metal more resistant to wear and corrosion than 500 Brinell stainless steel. Coupled with the new allow was development of a micro-optically flat seat and disc design. Since their installation at Jantzen the valves have performed perfectly with no repair or replacement to date. The LQ600 is currently replacing other types throughout the plant.

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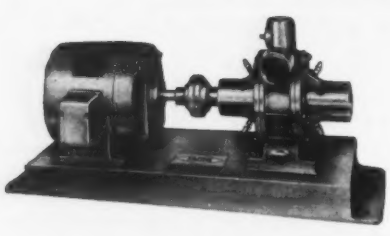

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$1,000 per year saved by blueprint folding machine

case history 39

The Sunnyvale Plant of Westinghouse Electric Corporation enjoys an annual saving of $1,000 by simplifying the tedious process of accordion-folding long blueprints. Cost of equipment involved was amortized during first year of operation.

The old hand method of accordion-folding blueprints required two girls who, during peak load periods, were unable to keep up with the demand for the large 36 in. wide prints that

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"EUTECTIC" WELDING HEADLINES - TIME - MONEY - MACHINERY SAVERS

EUTEC-CHAMFERTRODE REMOVES "FATIGUED" METAL FASTER

By using Eutec-ChamferTrode and Eutec-CutTrode, an Oklahoma hydro-electric plant avoided time-consuming grinding away of "fatigued metal" and accomplished the quick repair of a turbine bucket with great savings in "downtime" and labor.

The bucket, part of a 57-ton turbine, was in danger of cracking because of fatigued metal formation. The bucket's inaccessibility prevented the use of grinding equipment to remove the fatigued metal before welding on stainless steel plates. Eutectic's District Engineer recommended Eutec-ChamferTrode and Eutec-CutTrode, high speed electrodes for gouging, chamfering, and piercing all metals, without the use of oxygen or extensive equipment.

(Fig. A)

First, the fatigued area was marked off and an outline cut with Eutec-CutTrode. Weldors then gouged out the defective metal with Eutec-ChamferTrode (Fig. A). Gouging was accomplished far more quickly with ChamferTrode than would have been possible with any mechanical grinding equipment. ChamferTrode's special exothermic coating concentrates the force of the arc right at the point of application, producing a highly efficient metal removing tool.

(Fig. B)

Stainless steel plates were then tacked on with EutecTrode 680 AC-DC, an all purpose, high tensile, corrosion resistant electrode for very high alloy and carbon steels. Repair was completed by welding again with EutecTrode 680 AC-DC, which produced a smooth, porosity free weld of perfect density (Fig. B). The weld was deposited at the highest possible speed. Welding was done at lowest possible amperage and no warping occurred. Finished weld has exhibited high strength and wear. *(A-30)*

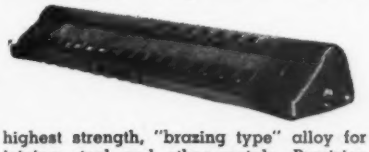
WELDING MACHINE BASE WITHOUT DISMANTLING SAVES $3200

Use of Eutec-ChamferTrode and Eutectic "Low Temperature Welding Alloys" to repair the heavy base casting on a planer without dismantling it from the planer saved an Idaho lumber company $3200 and four months "downtime." To replace the base casting, which cost $1200, the entire planer would have to be shipped to its East Coast manufacturer. This would have cost $2000 in railroad fares and kept the planer out of production for four months.

Eutec-ChamferTrode was used to give a right angle chamfer to all broken edges on the casting. The weldor then applied a dense, smooth weld of EutecTrode 27, a high strength, ferrous electrode for all cast iron repairs where machinability is not desired. The base casting was re-welded with Xyron 2-24, which permits "cold" cast iron welding from all positions without dismantling heavy sections. Xyron 2-24's "Frigid Arc" coating produced a dense, machinable weld, free from cracks and stress formations. Weldors have found that Xyron 2-24 gives very close color match and permits great ease of application. *(A-31)*

EUTECROD 16FC LOWERS FINISHING COSTS

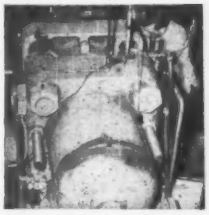
Warping and uneven welds caused by conventional high heat welding materials led a manufacturer of calculating machine carriage shells to try EutecRod 16FC, a



highest strength, "brazing type" alloy for joining steel and other metals. Precision standards for the carriage shells made warped parts unacceptable. Further finishing of uneven welds was an added cost to the manufacturer.

Use of EutecRod 16FC has resulted in lowered finishing costs and stronger welds. Great capillarity of EutecRod 16FC makes it ideal for thin forming operation required in welding carriage shells. EutecRod16FC produces a smooth, porosity free weld requiring no further extensive finishing. It is applied at the lowest possible temperature without fusion of the base metal. No warping occurs. Ultimate tensile strength is up to 100,000 psi. *(A-32)*

EUTECTRODE 680 AC-DC WITHSTANDS 1500 PSI



EutecTrode 680 AC-DC again demonstrated its high tensile strength in repairing the hydraulic compression chamber of an injection molding machine. Previous welds of conventional high heat welding materials all cracked under the stress of 1500 psi in the chamber.

Before replacing the chamber, at a cost of $4200, the company called in Eutectic's District Engineer. He suggested EutecTrode 680 AC-DC, all purpose electrode for high alloy and carbon steels. Deposited at high speed and lowest possible amperage, EutecTrode 680 AC-DC gave a smooth dense, porosity free weld which has combined high tensile strength (up to 120,000 psi) with sufficient elongation to absorb compression chamber stress without cracking. *(A-33)*

CAST IRON WELD SAVES $6,000, FOUR MONTHS "DOWNTIME"

By using EutecRod 1804 to repair a 50 HP motor which had eight cracked fins at the end of its armature, a New England aircraft plant saved $6000. This would have been the cost for removing the motor from the plant, repairing it, and re-installing it.

Company officials consulted Eutectic's District Engineer. He suggested repair with EutecRod 1804, a copper base, silver bearing, thin flowing alloy that produces high strength joints on close fitting operations. Using 15 lbs. of EutecRod 1804, a weldor repaired the armature fins in less than six hours. Welds have shown excellent wear and conductivity. EutecRod 1804 does not require fusion of the base metal; its ultimate tensile strength is up to 50,000 psi. *(A-34)*

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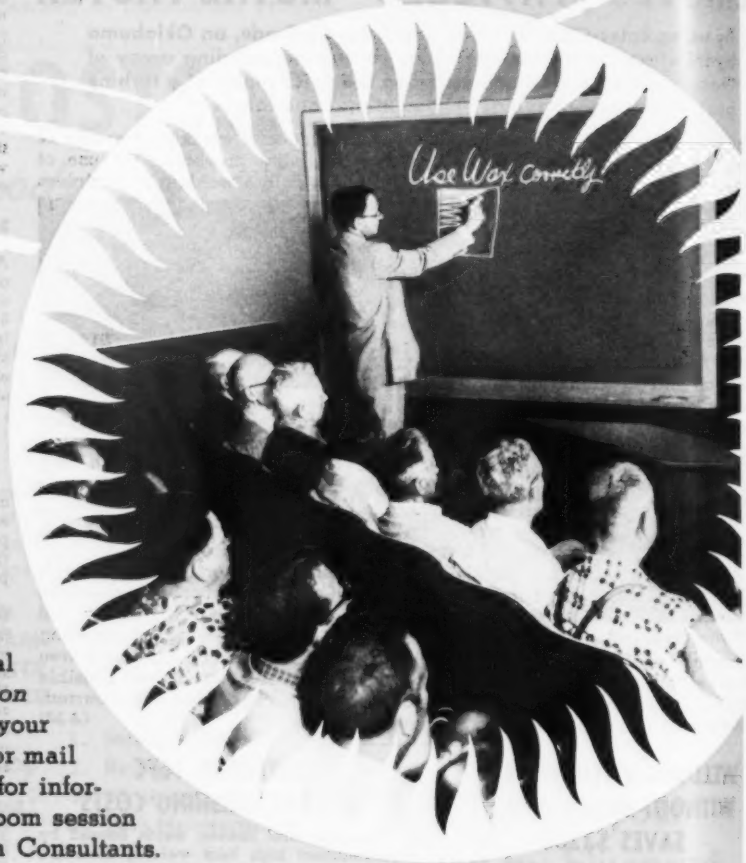

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Blueprint folding machine produces full-width accordion folds. Operator simply moves right hand lever in circular motion.

were from 3 to 25 ft. in length and had to be folded down to standard 8½ x 11-in. size.

Solution to this costly bottleneck was a McFarlane Plan Folding machine. By the use of this machine, the folding time has been cut from 11 to 4 sec. per ft. of paper length. Now one girl does the entire operation and even during rush periods is well able to keep up with the demand.

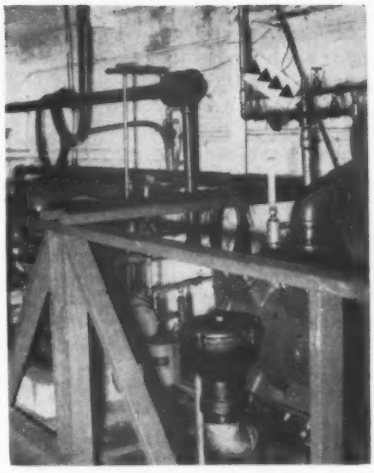
Automatic cooling water control valve does a man's work

case history 40

American Can Co.'s Pacific Div. Closing Machine Dept. in San Francisco, Calif., has eliminated the need for full-time worker and insured proper cooling of both its air compressor and its vacuum pump by installing an automatic cooling control valve in each unit's system.

An Ingersoll-Rand unit, the plant's compressor operates almost continuously due to the high air capacity requirement of this maintenance base for can closing equipment. Due to changes in water pressure, the flow of coolant through the compressor must be altered from time to time. J. F. Bastian, shop foreman, reports that checking temperatures on the two units and manually increasing or decreasing the rate of cooling water flow would require constant attention. The only other alternative would be to increase the constant flow of cooling water to a capacity that would handle the lowest water pressure conditions and the highest unit heat conditions. This would be costly in terms of unnecessary water consumption. Also, when operated too cool the units' lubricating oil is diluted by condensation formed on the outer surface of the cooling jackets.

The cooling control that has achieved these savings for American Can is a Sarco unit. As the cooling water leaves the jackets of either unit, it is fed to an automatic control. The control, valve portion of which is mounted in the incoming cooling water line, proportions the rate of water flow as dictated by the actual temperature of water leaving the cooling system. Thus, a predetermined temperature is maintained at all times. If water pressure drops— as it normally does when the wash-down department is in operation, etc.—the diminished rate of flow of cooling water to the unit is quickly sensed by the control and the valve opens wider to permit more water to enter the cooling system.



Cooling water control valve (see arrows) meets compressor requirements automatically.

Floor upkeep costs go down with extra-tough topping

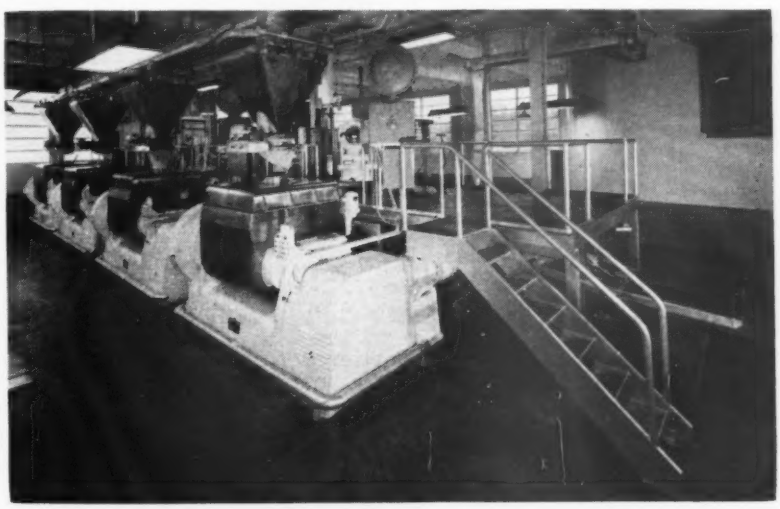
case history 41

Operating and maintenance costs at the new Wm. Wrigley Jr. Co. chewing gum plant in Santa Cruz, Calif., in the year-and-a-half it has been in operation have been kept at a minimum by careful pre-construction planning. Starting with the floor, the 150,000-sq. ft. building was designed to incorporate the most up-to-date construction, equipment, and methods of handling materials, processing, packaging and shipping.

Requirements for the floors were that they would have to be sanitary, non-absorbent, easily cleaned and free from cracks and crevices. They also had to be resistant to sugar and other ingredients which go into the manufacture of chewing gum, capable of withstanding necessary trucking. Good appearance was mandatory.

The Wrigley management investigated many different types of industrial floors and finally decided on a special ¾-in., granolithic, extra-hard topping installed by the Kalman Floor Co. of New York.

This topping is installed over an

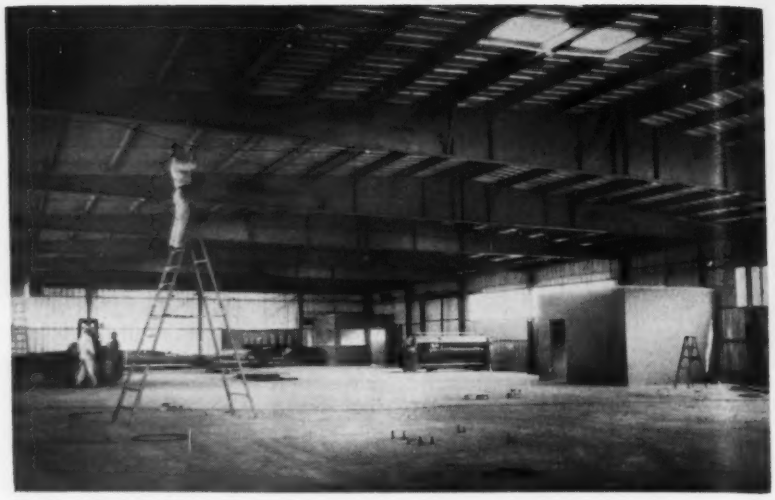


Floors in this food processing plant had to be sanitary, non-absorbent, easily cleaned and free from cracks or crevices. A granolithic, extra-hard topping was selected.

underslab. A process calling for a high water-cement ratio is used. After the water has hydrated the cement, excess water is withdrawn by means of absorption blankets which also condense and pre-shrink the mass. The result is a firm, tight bond between the topping and the base slab.

As soon as the absorption blankets are taken up, heavy power floats further compact the topping. Following this, mechanical trowels make several runs over the surface followed by hand toweling.

Steel building fills bill for strong roof and clear work area



Post-free structure is strong enough to support oversize cranes. Here workmen are completing electrical and heating installations in the "one-piece" steel building.

case history 42

Hufford Machine Co. has filled its needs for lots of unobstructed floor space and an extra strong roof at an economical price by erecting a simple steel building. Hufford, El Segundo, Calif., manufacturer of stretch forming equipment needed large unobstructed areas for its stretch forming equipment and at the same time had to have a roof strong enough to accommodate heavily stresed overhead cranes for materials handling.

A 70-ft. clear-span tapered girder steel building designed and constructed by Empire Steel Buildings Co. in Los Angeles, provided a post-free structure which allowed for flexible floor arrangements but was still strong enough for the oversize cranes.

In this case function and beauty were both economically obtained. The one-piece "Empirsealed" die-forming curved sheeting which is used on much of the building, and is standard on all Empire buildings, eliminates end laps and rids the building of any patched look. Sidewall sheeting tucks under the roof sheet so that the building is weather proofed. The uninterrupted expanse gives the building a streamlined modern look.

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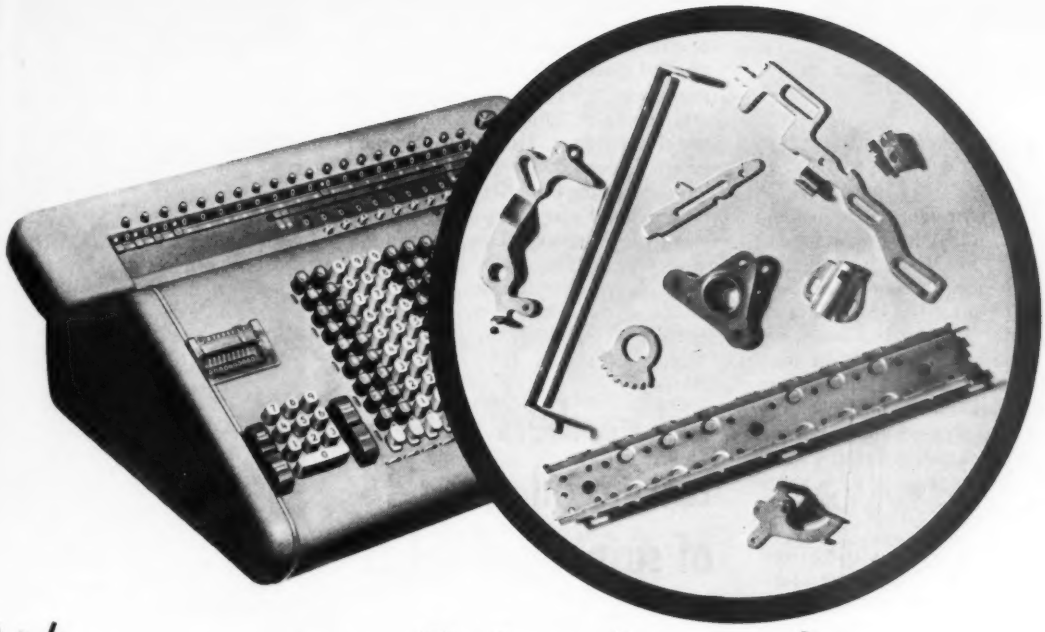

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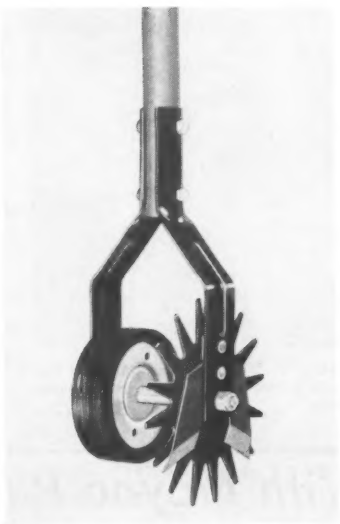

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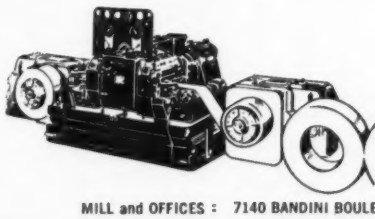

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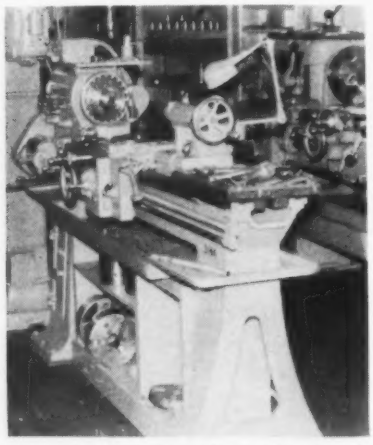
Machine coating boosts morale and reduces upkeep

case history 43

An enamel coating applied to 184 machines in Victor Equipment Co.'s San Francisco plant has resulted in reduced maintenance, improved morale and a boost in both production and safety. Manufacturers of flame metal cutting and welding equipment and accessories, Victor reports that the enamel also resists abrasion without chipping and adds years of efficient operating life to the equipment.

Subject to heavy smearing and spillage of oil and grease, the machinery was in need of a protective coating that would clean easily, stand abuse, and not be permanently stained by grease and oil. Inertol Machinery & Equipment Enamel was chosen for the job. All machinery was cleaned thoroughly and one coat of the enamel was applied. Green was used on manifolds, pipes, and pipe fittings and all machinery. Oxygen tanks, cylinders and metal carriages also were painted green. Generators were painted with the same enamel in red and dark grey. So successful was the application, that Victor Equipment plans to use the same coating process in its Ventura, San Diego, Sacramento, Oakland, Fresno and Los Angeles, Calif., district plants.



One coat of enamel made machines in this plant look better to operators and maintenance men.

Oil purifiers save cutting oil, get rid of suspended solids

case history 44

Production and quality of its product have been boosted, downtime slashed drastically, worker health and morale factors improved, and working oil saved in screw machine and chip wringer operations at Price-Pfister Brass Manufacturing Co. in Los Angeles. And it all stems from a battery of oil purifiers.

Before the purifiers were installed, working oils used in the machines were heavily laden with suspended solids—fine metal particles—after being used and recirculated. The metal particles were quickly depreciating machine tools, pumps, bearings and other working parts causing a costly and annoying maintenance problem. Reject totals were climbing because the metal particles would score the product finish. And operators were subject to the very serious problem of dermatitis—inflamation of the skin caused by metal particles and bacteria formations in the oil.

Fine metal particles in recirculated cutting oil were causing operators to suffer the effects of dermatitis until this battery of oil purifiers was installed.

Now as the oil is circulated out of the machine tool systems, it is piped by gravity flow to a 250-gal. underground storage tank. When the tank is full, a motor-pump is started forcing the oil through a 12-kw. heat exchanger and on into a battery of Mayhew Products oil purifying units. After purification the oil is fed by gravity into a second 250-gal. underground storage tank.

From here, the clean oil is distributed under pressure to each machine tool. After use of the oil in the machines the cycle, which is semi-automatically operated and continuous-flow, begins again. Metal particles and any other solids are removed from the oil by the purifiers and bacteria formations are prevented by heating in the heat exchanger.

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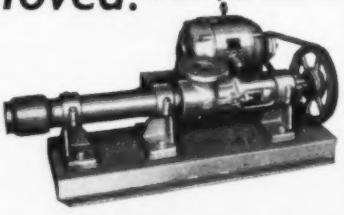

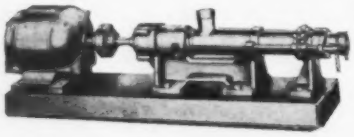

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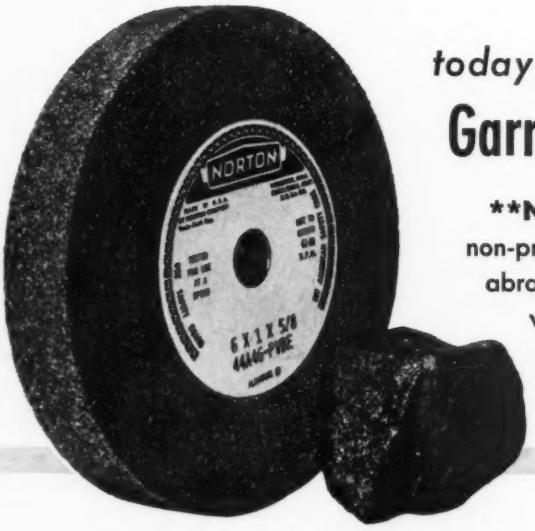

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Versatile grease extends heavy truck lube period 100%

case history 45

A 100% extension of lubrication period, simplification of lubrication work, a need for fewer drums of lubricants on hand, and a space savings have been achieved by the Joe. J. Rossi Trucking Co. of Fort Bragg, Calif., haulers of gigantic redwood logs. The firm's trucks haul loads up to 100 tons over rough roads from in-woods landings to mills for processing.

To keep the trucks in good condition, each was completely lubricated every day. However, as the fleet expanded to 30 diesel rigs, this lubrication period became difficult to maintain. It was decided that a multi-purpose grease would simplify the task and perhaps speed it up to a point that would enable continued every-day lubrication.

A small quantity of Shell Oil's Alvania was first tried on a few diesel rigs in the toughest spot known to lube men—the fifth wheel. Assuming a 100-ton load was being carried, about half

Tough fifth wheel application was used to test effectiveness of multi-purpose grease.

of which is supported by the pivot unit, pressures on the 14-in. fifth wheel would be about 65,000 psi.

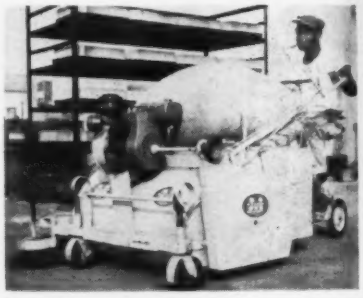
The multi-purpose grease served satsifactorily in the fifth wheel application and its use was extended to all grease fittings. By substituting the grease for several types of sodium-base, calcium-base and other types of greases, fewer drums, fewer grease guns, less space, and less inventory are required. Chance for application of the wrong lubricant is eliminated. The Alvania, deriving special properties from lithium 12-hydroxy stearate in the soap used in its manufacture, may be applied in place of either calcium or sodium-base greases.

After testing the grease, it was found that lubrication periods could be extended from every-day to every-two-days.

Half-acre plant sweeping costs cut 90% by power unit

case history 47

Sweeping costs have been cut by more than 90% for the Gaines Co., Rivera, Calif., producer of light metal castings, by the purchase of a new power sweeper. The 30,000-sq. ft. Gaines plant can be swept twice each day in just ½ hr. To cover the area in the same time



Operating efficiently indoors or outside the unit is used to clean parking lot also.

with hand sweeping more than 15 men would be required. Use of the sweeper has reportedly also increased plant safety; the floor is kept cleaner and even bulky floor debris is absorbed into the hopper.

The sweeper, which operates with equal efficiency indoors and outdoors, is also used to clean the large parking area that adjoins the Gaines plant, and the cement area in back of the plant which is used for sand casting and storage purposes. Together, the inside and outside area equal an acre and a half. Two full time maintenance men were formerly required to keep this area clean. Today, with one man doing the job in just two hours, the sweeper will pay for itself in 45 days.

The unit used by the Gaines Co. is a Modern Power Sweeper product equipped with a side broom that cleans along walls and curbings and will sweep up heavy objects as well as dust, paper, leaves and cuttings.

case history 46

Simple lift truck attachment speeds snow removal job

Many bonus uses for lift trucks have cut costs in Western plants. A seasonal example is conversion to a snowplow. Coleman Builders Supply, Inc., Pocatello, Idaho, uses its 4,000-lb. capacity Hyster lift truck to keep the company's yard clear of snow. A piece of plywood is placed in front of a pallet of thick-butt shingles on truck forks. According to reports, it makes a first-class snowplow.

This test panel is used to demonstrate the rigidity of plaster applied to K-Lath. The galvanized wire mesh, and perforations in the paper, serve to "key" the plaster tightly to the lath. The printed black lines show where it is to be nailed, stapled, or clipped to studs and joists.

Steel wire mesh stitched to paper cuts lathing time, strengthens plaster

K-Lath, a new type of lath combining paper and galvanized wire mesh, is gaining rapid acceptance, according to its makers, the K-Lath Corp., Alhambra, Calif. Stitched to a heavy kraft paper backing, the welded wire mesh strengthens the plaster so that it can resist lateral strains such as those created by an earthquake. Made in panels 50 x 28 in., K-Lath is easy to handle, reduces waste, and is quickly installed.

Galvanized steel wire in 13- and 16-gage sizes is supplied from the Bethlehem Pacific wire mill in Los Angeles. The wires are electrically welded to form a 1½ x 2 in. mesh, then stitched into the paper before being cut into panels.

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MATERIALS HANDLING, PACKAGING & STORAGE

Operatorless tractor slashes cased-goods handling costs

case history 48

Over the long haul an electronically controlled industrial tractor will reduce costs in handling food products for Nalley's Inc. The Tacoma, Wash., food concern estimates that savings gained through releasing the operator who formerly handled a gasoline-powered tractor will pay for the electronic unit in less than two years, and from then on it's gravy—or salad dressing and syrup in this case.

Nalley's 67,500-sq. ft. warehouse, where food products are received from production at one end and carried in pallet loads on trailers to transient storage at the other, is home for the electronic Guide-O-Matic. Its guide wires have been imbedded in the floor and it makes its way at a predetermined speed—in this case, 200 fpm.—along its route, stopping automatically at the end of the line where it crosses an aluminum plant. Motivation is delivered electronically to the tractor from the guide line without physical contact between the two.

Once automatically stopped, the four or five trailers are unloaded by fork truck before the battery-powered Guide-O-Matic trailer returns them for reloading. At the loading end of the line, the tractor is again automatically stopped and uncoupled and manually operated into the desired spot where it is coupled to a train.

No extra cost was incurred by changes in normal handling operations when the operatorless tractor was installed because it performs the same movements formerly made by the gasoline tractor with operator.

Even when making turns and towing a heavily-loaded trailer-train, this operatorless electronically controlled tractor follows predetermined path closely.

Crates of apples are stored in quickly accessible order and stacked higher in unit loads when handled by lift truck.

75% less manpower needed with electric powered lift trucks

case history 49

One truck and two men storing four carloads of onions in eight hours; four trucks and four operators doing the work of 16 men; a 75% reduction in materials handling manhours. This and much more has resulted from the purchase of four electric powered fork lift trucks by British Columbia Ice & Cold Storage Co. in Vancouver, B. C.

Formerly the company, which warehouses produce and frozen foods, handled its loads manually with hand and push trucks that required great manual effort and involved an uneconomical amount of time. Also, the company couldn't make complete use

of its vertical storage space.

When it was decided to switch to industrial trucks, four Elwell-Parker electric powered models were purchased on the basis of clean operation, freedom from exhaust fumes (a major consideration in food processing operations) and low operating temperature, all important factors in handling food in refrigerated areas. Maintenance costs were low too.

With the industrial trucks British Columbia Ice can make maximum use of its air conditioned storage space by assembling products into master unit loads and stacking them to the ceiling. This also provides greater order and makes things more accessible. Still a further savings results from mechanized handling; food for storage can be moved into air conditioned rooms in a much shorter time, so that minimum cold is lost in the process.

Four lift trucks were replaced by this heavy-duty unit capable of carrying ten 4 x 4-ft. pallet loads of lettuce. Lift truck scale eliminates one step of unloading operation.

Lift truck scale boosts speed of lettuce unloading operation

case history 50

One heavy-duty lift truck equipped with a lift-truck scale has replaced four lift trucks and their operators, and greatly accelerated unloading of lettuce from trucks arriving at Crystal Ice and Storage Co. in Phoenix, Ariz. Also eliminated is the long wait truck drivers often experienced upon delivery to the plant, during one of which every truck parked in line in the street waiting to be unloaded was ticketed by the police.

Previously, four small fork trucks were rushed to unload the 10 pallet loads carried on each vehicle. One by one the pallet loads were stacked in storing areas. Later each of the loads were picked up, carried to a platform scale, weighed and returned to the stacking area.

While operators of the plant fully realized the press of this operation during the lettuce season, the ticketing incident drove it home to the point where they realized that what they needed was a lift truck with enough forks to unload a highway truck in one move. Trucks of this capacity and design were available but they carried a load too large to be weighed on a platform scale.

The problem was solved by a Gerlinger Carrier fork truck equipped with a Martin-Decker lift-truck scale. The four small lift trucks were eliminated. Now the operator unloads highway trucks in one move, makes a note of the weight shown on the lift-truck scale and immediately moves the load to the stacking area.

Operators of the plant feel that the lift-truck scale, figuring in hourly operation cost of the four trucks and wages for their operators, paid for itself in the first 9½ hr. of operation.

Cord belt beats battery acid-ridden conveyor problem

case history 51

Conveyor belt replacement costs—previously incurred at the rate of one every six or eight months — have been drastically slashed at a California auto battery salvage plant. The salvage process requires high heat to soften outer cases and tar content so the lead plates can be removed, melted down and used again. The process also involves sulphuric acid spillage.

Drenched with the acid, tar and hot water, the remains of the batteries are moved through the plant by conveyor belt. Belting specially designed for handling hot materials lasted only six or eight months in this plant. However, one has now been installed that has outlasted—by 50%—all other belts tried. And engineers are predicting several more years of service from the material.

It is a B. F. Goodrich cord belt made with cords running lengthwise and held in place by a new heat-resisting rubber. Besides standing

Until this battery salvage plant changed to a cord-type belting, heat and acid in the operation was taking a conveyor belt toll at the rate of one every six or eight months.

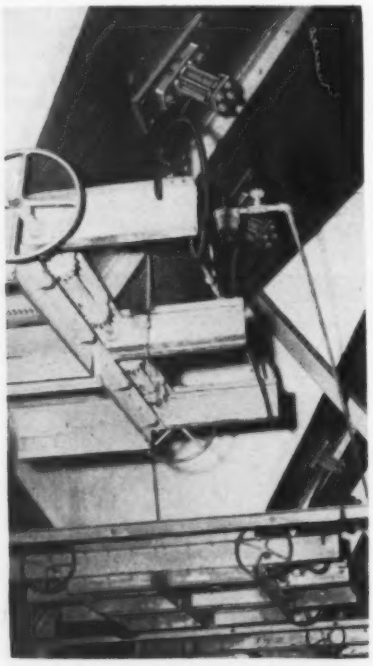
higher temperatures, the cord belt can take crashing blows that would cut, gouge and break an ordinary belt. If an accident should cause a cover cut, there are no cross threads to spread acid that would weaken or rot the belt. The rubber surrounding each cord restricts moisture to the cut spot.

Vibrators call halt on feed bin poking and hammering

case history 52

Dollar savings resulting from reduced labor and time required to unload poultry mash from divided bins were recently realized by a large California milling plant. Enabling the mill to cut its costs are 16 two-in. vibrator units. Further savings were realized because former methods of removing the mash from the bins—such as pounding sides with a sledge hammer or prodding the mash through—often caused bin damages.

Four Cleveland vibrators are installed on each of four bins. One automatic lubricator for each pair of vibrators is used while one pressure regulator controls air supply to all 16 vibrators.



Four vibrators (installed on sloping surfaces of bins above) keep poultry mash loose and easily unloaded into trucks.

Change from individual to bulk package handling of windshields saved space and time for large Western glass distributor, but presented handling problem. Lift truck solved it.

One man and a lift truck do four-man, 2-hr. job in 15 min.

case history 53

At the United Glass Co., Oakland, Calif., four men used to stop their normal work for two hours to unload a truckload of windshields; now, one man does the same job in 15 min.

When curved windshields first became popular, United Glass Company, a distributor for Shatterproof Glass Corporation of Detroit, preferred to receive most of their windshields in individual cartons because it facilitated their stock handling. Individual cartons took a lot of space, but they stacked them as high as possible and put up with the situation. However, as more and more curved windshields were used, the problems of space and handling became greater.

Many attempts were made at solving the problem, but the answer finally appeared to be a bulk package carrying from 15 to 50 curved windshield units with the weight running from 500 to over 1,000 lb. This afforded far better protection against breakage and solved the carriers' complaint of big bulk and no weight. At the same time it saved warehouse space for Shatterproof's distributors. But the cases were far too heavy to be "manhandled." A lift truck did not at first appear to be practical because of the limited use. However, after having the materials handling problem surveyed by several industrial truck salesmen, United Glass selected a Mobilift gasoline stand-up fork truck because of its efficiency for on-and-off operation and its maneuverability. With one man unloading a complete shipment and putting it in storage in 15 min., work in the shop goes on without interruption when a shipment is received, and the cases are stacked up to the ceiling, utilizing new storage area.

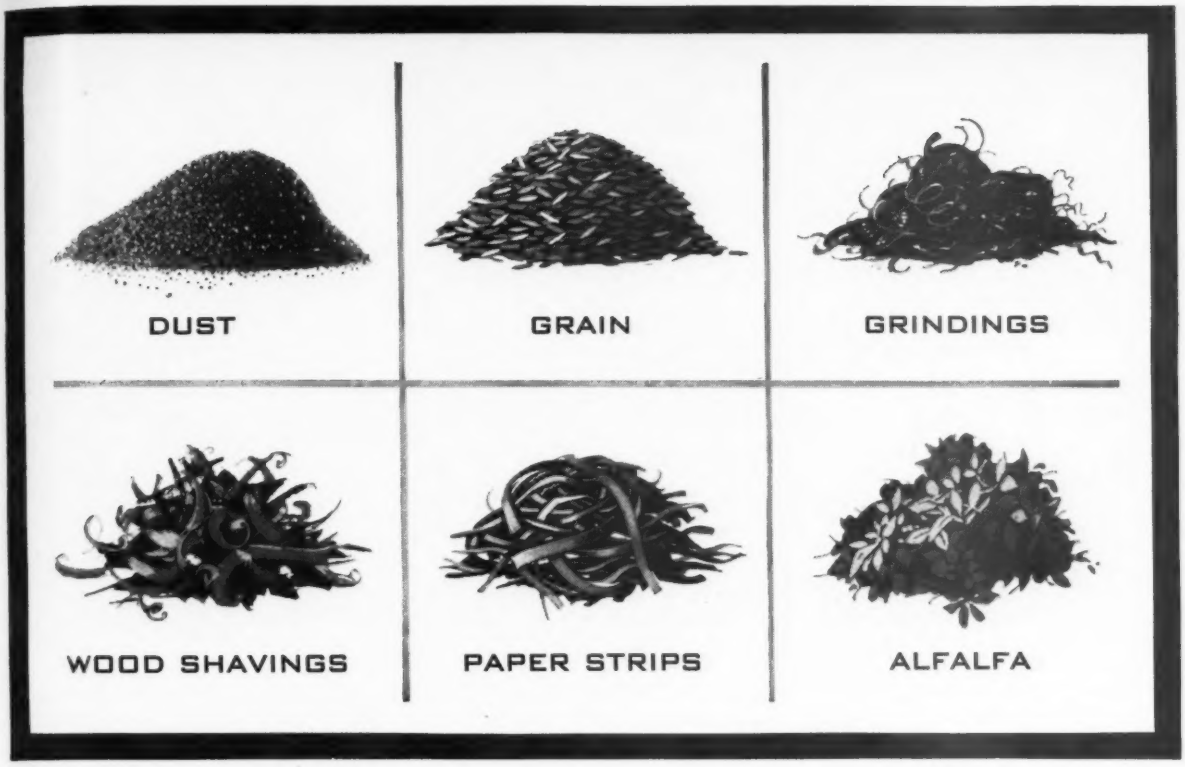
At first, United planned to use the fork truck for unloading only, but now it is being used almost full time by the stock men to fill orders.

Two electric hoists speed and simplify rail car production

case history 54

Teaming up to keep production rates high and handling costs low at Pacific Car and Foundry in Renton, Wash., are two one-ton capacity electric hoists mounted on trolleys that operate from "I" beams running right over assembly lines where this plant mass-produces refrigerator cars.

The hoists—Yale Load King units—are used to place the ceilings in the refrigerator cars. The car ceiling is assembled as a single unit on a jig. When the assembly process is com-



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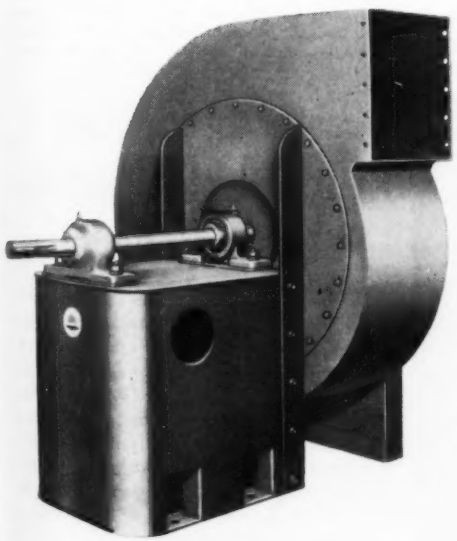

Lick tough process applications with the versatile American Blower Industrial Fan.

The secret is their versatility. You see, the American Blower Industrial Fan is available with three types of wheels: Type AH for air handling, Type MH for material handling, Type LS for long shavings.

And there's a wide range of fan arrangements, optional constructions—for severe duties or high-temperature operation—and optional accessories to allow fan modification to suit an individual job.

What's more, it's available as a packaged fan—that is, a self-contained unit with its own motor, drive and weather-proof hood enclosure. This eliminates the need for a separate motor foundation, and the complications of motor lineup, belt centers and weather protection.

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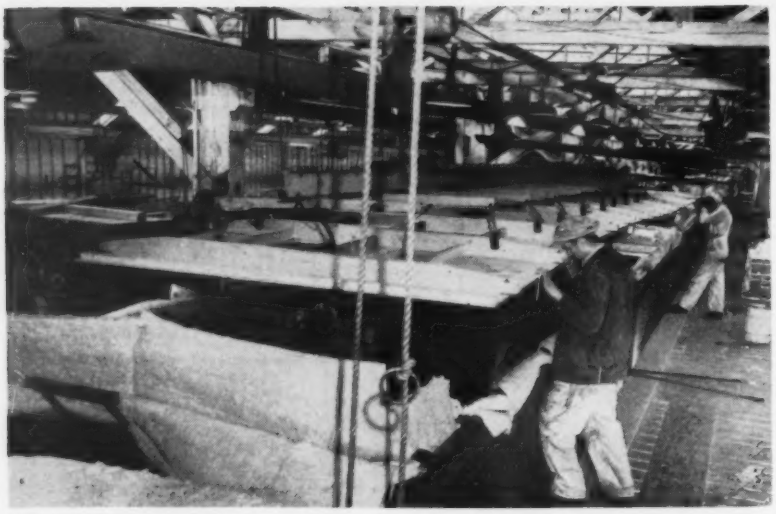


Operating in tandem through use of dual controls synchronized by mechanical master switch, two electric hoists lower refrigerator car roof accurately into place for assembly.

pleted, the ceiling is placed on the floor. The hoists are attached to a metal spar which has cross members with clamps that are secured by workers to refrigerator car ceiling beams.

With the ceiling securely supported in this manner, the hoists raise this bulky load some 15 ft. in the air, transport it across the top of a raised work scaffolding and lower it accurately into place in the top of the refrigerator car. In this operation, the hoists operate in tandem through means of dual controls that are synchronized by a mechanically actuated master switch cam.

Walk-along lift truck solves two tough handling problems

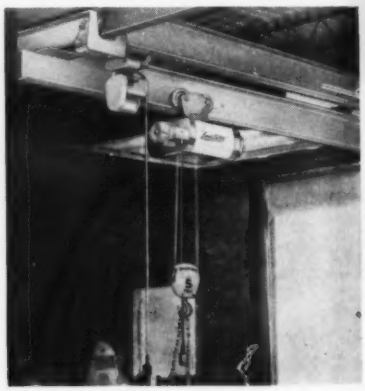
case history 55

Two materials handling problems—one in production, the other in loading operations—have been solved for W. P. Fuller and Co., in its South San Francisco plant by a walk-along type lift truck.

First of these was caused by rapidly increasing production of varnish. Ingredients must be cooked over oven fires. Until production of the ingredients became so demanding, W. P. Fuller could handle large kettles of the liquid manually. However, it soon became necessary to cook larger batches of the ingredients at a time. Solution to the problem was use of an 800-gal. stainless steel kettle mounted on wheels. The kettle is moved on and off the fires by a specially designed Revolvator Go-Getter walk-along truck. It lifts one end of the kettle in the same manner as semi-live skids.

Second problem, and one common to many plants these days, is the fact that the plant's loading dock is lower than the tail gates of many over-the-road trucks. Thus, loading skidded products was difficult. Solution was a dock board and a low-lift Go-Getter. With some truck trailers the grade of the dock board is as much as 12%, but equipped with a heavy duty differential dual wheel drive, the lift unit carries loads into the truck with ease. Fingertip controls and easy steering permit accurate spotting of the product within the trailer.

Walk-along type lift truck takes heavy load up grades as steep as 12% to get products into truck vans. Increasing heights of trailer tailgates previously posed a problem.



Two electric hoist runways have speeded job cycling by increasing plant's floor coverage. Installed in a new plant, the system replaced single monorail system used in old plant.

Faster production with electric hoists; less labor needed

case history 56

A large reduction in the man hours required to complete jobs at Berry Bros. Machinery Co. has been realized from installation of modern overhead handling equipment. In its former plant, the firm used a single monorail system supporting old-style chain blocks for moving and installing heavy machinery parts.

This Dallas, Texas, plant repairs, rebuilds and sells road and construction machinery. Realizing an increase

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in volume of business a new plant was built recently. Producing the overhead handling savings are two Shaw-Box crane components which Berry Bros. used to fabricate two electric hoist runways. Each runway is electrically driven by a Shaw-Box Budgit bridge drive for speedy work cycling. Two 5-ton Shaw-Box Load Lifter electric hoists do the lifting.

Low efficiency due to poor floor coverage, low capacity, and slow job cycling have been eliminated with the new system, thus drastically cutting the number of man hours needed per job.

After picking, orders are consolidated on specially constructed conveyor which delivers them to shipping area. Lift trucks transfer pallet loads from conveyor to delivery trucks.

Lift trucks are key to more effective warehouse operation

case history 57

By up-dating its materials handling system, Germain's Inc. of Los Angeles has saved plant operating dollars in the forms of labor, time and warehouse space. Furthermore, the company is able to offer faster service to customers now. This producer of seeds for field, lawn, flower and vegetable markets has nine different divisions, five of which are located in separate warehouses. Thus, it was highly difficult to coordinate operations of each division so that customers might receive all goods ordered in a single delivery.

Germain's called upon a local industrial consultant, W. B. Semco, to plan a more efficient system. His first move was recommending the purchase of riding, walking and hand-type industrial trucks to be used in the firm's order-picking operation. Lewis-Shepard hand hydraulic pallet trucks and Jacklift Electric "walkie" hand trucks were selected.

Next, came replacement of the five different warehouses with one, and rearrangement of departments. Then order systems and procedures were altered. With the resultant rearrangement, it was found that only 160 ft. of 24-in. wide conveyor belt would tie all warehousing operations to the area where orders are consolidated, made up on pallets and placed on a pallet conveyor.

The specially-designed in-floor pallet conveyor has a capacity of 200 loaded pallets per hour. Each loaded pallet weighs 2,000 lb.

In the order department, order pickers use both Lewis-Shepard hand hydraulic pallet trucks and Jacklift Electric "Walkie" hand trucks for transporting materials. After orders are picked they are deposited on the inlet rollers of the pallet conveyor, where intermittent power allows careful placement of loaded pallets. The rollers are spaced so that any of three types of Lewis-Shepard pallet trucks in use at the warehouse can deposit or remove loads.

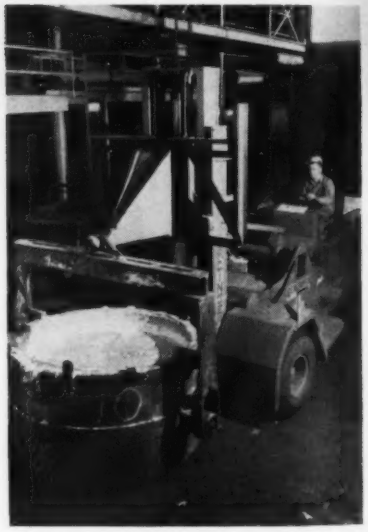
The entire system cost Germain's $10,000. According to Semco, the industrial consultant who planned it, savings accrued would pay the entire bill for all new equipment in one year.

Special fork truck moves molten aluminum faster

case history 58

By altering its materials flow pattern to centralize pouring facilities, production has been increased at the Northwest Reduction Plant of Reynolds Metals Co. near Portland.

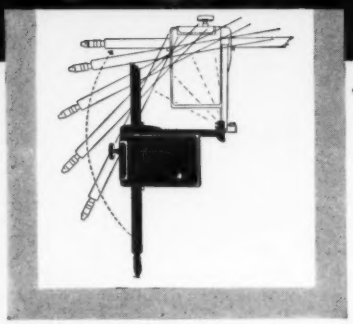
The problem was to transport crucibles containing five tons of molten aluminum from the reducing pots to the pouring, or casting room. There it is cast in molds and cooled in its final form. It then moves to the storage shed to await shipment. Floor traffic in the area was heavy, overflow had to be avoided, and several hundred yards had to be traversed by whatever handling equipment was used to move the crucibles.



Five tons of molten aluminum are moved each trip with this special Ram-equipped heavy-duty fork lift unit.

An overhead crane capable of doing the job was considered, but high cost, installation time and lack of versatility were thought to be detriments. A highly maneuverable vehicle capable of moving the crucibles was found in a special "Ram" for grasping the crucible, built for the plant by Gerlinger Carrier Co.

Although two Gerlinger fork lift trucks were delivered, only one has been used on the job for which it was built. The other, on a standby basis, is used for other jobs around the plant since the crucible truck has been on duty 24 hr. a day without difficuty.



New Airco Model C Heliweld automatic head operates at all angles from horizontal to vertical.

Airco introduces New Automatic Heliweld Head for long-run production welding

The Model C Heliweld automatic head is specifically designed for long-run production on regular or irregular contours — aluminum tubing, motor stators, irregularly-shaped pressure vessels. Its prime advantage is that once the required arc length is set the head will automatically maintain this distance by moving the holder up or down to follow the contours of the work piece. Other benefits are:

- **Versatility** — unit provides good arc voltage control using either argon or helium shielding gases or mixture of both.
- **Adaptability** —the head can be operated at all angles from the horizontal to the vertical (normal) position. The maximum raise-lower distance of the electrode holder is a full 16".
- **Flexibility** — the assembly can be used for AC or DC welding, with or without filler wire. Electrode diameters range from .020 to ⅛".

The use of the new automatic head will be required where welds of consistent dimensions and quality are important and where good weld appearance is necessary or where welding specifications are very high for the electrical, aircraft, and refrigeration industries. Complete information covering the wide range of applications and detailed specification data is available. Write Airco at the first opportunity.

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. . . for more details, circle No. 51 on Reader Service Postcard

Two side-loading units handle heavy pipe with ease

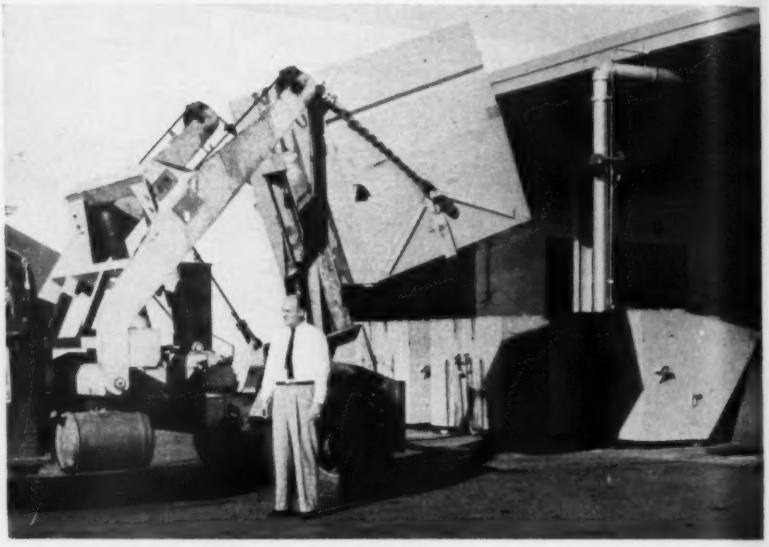
case history 59

Two side-loading fork lift trucks have eliminated the need for many pieces of materials handling equipment to stack and carry 24,000 ft. of pipe daily at the Utah pipe mill of U. S. Steel Corp.'s Consolidated Western Pipe Division. With two trucks doing all the work necessary in pipe handling, the firm's original investment in equipment has been reduced extensively as have maintenance costs and number of operators required.

Because Consolidated's new Utah mill has never used any other equipment for handling pipe, no direct cost comparisons are possible, but cost advantages were obvious when other methods were considered. Standard fork trucks would be too slow to move efficiently around the 23-acre storage area and would require too much space for travel, since loads would be carried crosswise on the forks. Mobile crane would also be too slow while dangling long loads; therefore more than two units would be needed to keep up with the plant's output. Motorized roll conveyors, another method considered, would have required a high initial investment, would have been inflexible and would have required additional equipment for stacking.

The two 10,000-lb. capacity Baker-Raulang Traveloaders used can lift to a height of 12 ft.; since they load from the side they carry loads parallel and can handle long loads in narrow aisles. They can also travel up to 20 mph. and load and unload themselves at the end of each trip. They have proved so efficient in handling pipe that they also have free time to help with lumber handling.

The two side-loading lift truck units used in this pipe operation lift to a height of 12 ft.



Special hoisting unit backs in to place an empty 10-cu. yd. rubbish container. Observing the operation is W. R. Umbreit, Anheuser-Busch's superintendent of packaging and shipping.

Mechanized waste handling is more efficient, costs less

case history 60

Handling waste materials at Anheuser-Busch's new Los Angeles brewery is being accomplished at the lowest possible cost, but with the highest possible degree of cleanliness and sanitation. Using a special container system, the operation has been mechanized and requires very little manpower.

During the month of October, for example, 47,500 lb. of cullet were handled direct to disposal point without re-handling at this modern Los Angeles brewery. Handling the waste is a Dempster-Dumpster system. Drop-bottom and tilt-type steel containers are used in the buildings for accumulation, and large storage containers are conveniently located outside the brewery site grounds. One Dempster-Dumpster truck-mounted hoisting unit picks up, transports, and dumps heavily loaded containers. Top lids with counterbalanced springs and end loading doors are closed when not in use. Other Dempster-Dumpster containers on casters are rolled out of the buildings when loaded and hauled to a dump in multiples of three or more. This hauling requires only the time of one man who operates the Dempster hydraulic unit.

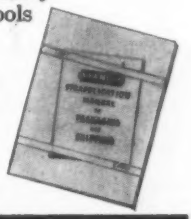
The system has also handled hundreds of yards of salvable tin cans which were disposed of as scrap metal during the past year. Containers are fire and scavenger proof, thus providing both safe and neat storage of rubbish too.

One of several "Insert" containers of various capacities that are carried to the dump by a "Master" container, three or more at a time.

Another **STANLEY STEEL STRAPPLICATION*** on the job

This job tension relieves headaches

There's no need to worry about the spilling or damaging of these close tolerance stampings (1,200 lbs per truck load) on their mile-long intra-plant trip to the assembly point. Stanley Steel Strapping has the great strength required to take and hold the tension that guarantees a **secure, safe** package. For the same reason, Stanley Steel Strapping is the logical choice to keep any material or package YOU ship securely bound and completely safe in transit to **any** destination. Stanley can provide whatever size strapping is just right for your needs and the tools — hand or power — that assure easy, fast strapping.



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. . . for more details, circle No. 52 on Reader Service Postcard

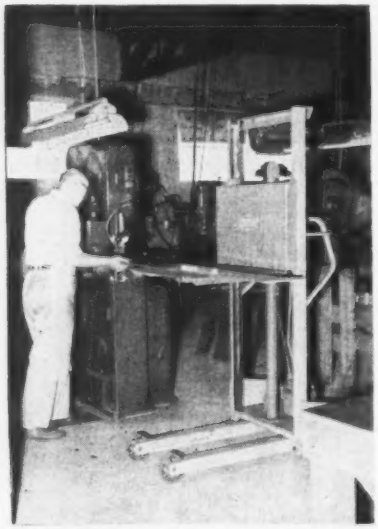
Portable lift saves machine shop time and labor

case history 61

Three different recurrent jobs at Advance Tool Co.'s Redwood City, Calif., plant, each formerly requiring the time and labor of two men, now require only one man and a portable hydraulic lift. And the "labor" has been removed from each task. The man involved simply operates the hydraulic lift.

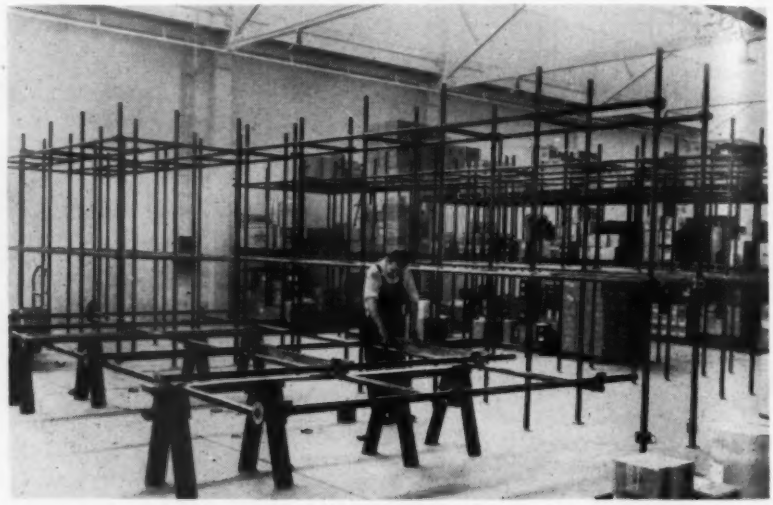
First job on which the portable lift is saving time and money for Advance Tool is that of loading and unloading trucks. Advance Tool produces tool and die molds and precision machinery items, many of which are extremely heavy. Until the hydraulic lift —an Oster ½-ton unit—was purchased, it took at least two men to load the finished units into trucks and to unload incoming materials. The job is handled with ease with the hydraulic lift.

Removing bar and other types of stock from racks is another task in which the lift has been put to outstanding use. It previously took two men to handle heavy and long unwieldy metals. One man operating the portable lift can handle any item stocked in the plant, putting it in stock or moving it to one of the many machines in the shop.



Eliminating the need for one man, a portable lift helps machine tool operators feed lengthy bar stock during machining.

Once long lengths of bar stock are at the machine tools, they present an in-process handling problem. Some jobs called for two men during the tooling of such pieces—one to operate the machine, the other to support the extending piece of stock and help feed it. Machine operators now use the lift to support the ends of lengthy pieces of stock during machining, thus freeing one man for other work.



Here stands the partially completed Ed Gonzoles Monument (that's Ed in the middle), a rack-type storage system involving 213,000 feet of pipe and 4,000 universal clamps.

One man installs rack-type storage system, space saved

case history 62

A rather humorous touch figured in gaining much-needed space through installation of a rack-type storage system at the Los Angeles County Stores Department in Southern California. Built only a year ago, the storage warehouse had been estimated as large enough to house needs for storing materials and products of many descriptions for at least a five-year period. However, as is so often the case in the West, within a year Los Angeles County had to review its facilities and the use that was being made of space.

At this time Edward Gonzoles, an office worker of the department for many years, was conscientiously going about his duties . . . (but we'll get to Ed in a moment).

It was obvious that one of the shortcomings of the existing system was that the warehouse was not taking complete advantage of height. Research on all available methods and systems of rack construction was begun. Tube-Strut universal clamps, together with ordinary pipe, were selected as a means of gaining more effective vertical space usage. Racks constructed by this method take less time and installation could be handled by a maintenance man in his spare time.

However, when the materials arrived, the maintenance department was flooded with work and could not supply even a spare-time man for any job. Stores department refused to be licked by the situation and in the true spirit of the service, the warehouse superintendent called for a volunteer. Ed Gonzoles doesn't say whether he found himself elected "army-style" or not, but he does report that he enjoyed every minute of the job.

There were 128,000 sq. ft. involved and when he was first briefed on the rack installation, Gonzoles thought it might prove to be an undertaking "that would keep me busy until I retired." However, no time was wasted getting the job done. No cross bracing was necessary, despite the fact that materials and products ranging from bags of cement to office desks were to be stored. The entire installation involved 4,000 universal clamps and 213,000 ft. of pipe. And there it stands today—"the Edward Gonzoles monument!" Over 40 mi. of pipe covering three solid acres. A monument to a "volunteer" who found it was an exciting challenge to leave an office desk and create a large structure with his own hands.

Fork trucks slash handling costs 87%; minimize breakage

case history 63

Over-all cost of materials handling has been slashed by 87% at Roma Wines Fresno, Calif., plant. Damage to fibreboard cartons and breakage of bottles, both considerably in excess of what Roma could consider normal or necessary, were factors that initially justified installation of the mechanized system that has effected the high reduction in materials handling costs.

Other problems recognized as stemming almost entirely from the outmoded manual handling methods used included creation of bottlenecks in the flow of materials, inefficient use of storage space available and costly rehandling of the product in the course of production, packaging and shipping. Roma originally relied entirely on manual methods to unload and stack incoming shipments of bottles received in quantities of 2,500 to 3,000 units in fibre board cartons.

Five separate manual handling operations took place before these containers started through any production lines. And several additional handlings were required in the storage and shipping departments after the bottling of the product was completed. Each carton of glass had to be individually unloaded at the receiving dock, placed on a roller conveyor and run to storage. Stacking the cartons in the storage area was a third manual operation and, when the glass in storage was needed on the bottling lines, two more manual operations occurred—returning the containers to roller conveyors for delivery to the bottling department, and then transferring them to one of eight bottling lines.

Today, with a sweeping modernization of handling methods, traffic into and throughout the Roma plant is accomplished by direct mechanized flow of materials all the way from the glass producer's shipping dock to the head of the Roma bottling line. This has been accomplished through the palletizing of all materials to be handled and the introduction of fork lift trucks to transport them. Each lift truck has a 4,000-lb. capacity. All are equipped with automatic transmissions and powered by LP-Gas units. The latter are particularly desirable for warehousing operations because this gas burns cleanly and completely, holding fumes and odors to a minimum.

Together with the elimination of two long roller conveyor lines, these fork lift trucks have served to cut manpower required by 70%—releasing men for more productive jobs—and reduced overall handling costs an estimated 87%. One of the biggest savings in time is in the unloading of bottles, at the receiving dock. Each lift truck carries two pallet loads of 64 cartons each on the trip to the storage area, thereby cutting overtime costs and reducing the unloading time for 3,000 cartons of glass from 27 to 1½ man hours.

So that the fork trucks could be used to stack and unstack unit loads with maximum efficiency, it was also necessary to make a revision in the company's warehouse layout. This involved removal of a mezzanine floor

Special telescoping mast design on this lift truck permits carrying of loads into rail cars.

and two wall partitions located near the head of the bottling lines. While simple in itself, this change served to increase storage capacity 400% by allowing four and five high pallet stacking. At the same time storage of pallet loads of empty glass bottles much closer to their point of use was afforded.

There are, as already mentioned, eight production lines at the Roma Wine plant. To keep Roma's eight production lines supplied with bottles, fork lift trucks transport pallet loads of "empties" from the glass storage area to a nearby unloading station. Here the bottles are lifted by power conveyor and fed by gravity into the various bottling lines as needed.

As filled cases arrive in the warehouse by trailer-train from the bottling department, the fork lift units pick up the fragile loads and move them either to storage or directly to the shipping department. Originally the cases were stacked manually about 20

High lifting ability of this truck makes it possible to stack cartons to ceiling height.

units high by passing them up in a time-consuming "pyramid" method. Using lift trucks, it requires only two minutes per load to stack 64-case pallet loads four to five pallets high. Glass breakage which regularly occurred with manual handling into and out of this "finished goods" storage has been completely eliminated and cartons receive none of the destructive wear-and-tear experienced under the previous method.

The shipping department is another at Roma Wine which has benefited greatly from the introduction of fork lift equipment. Not only are these trucks used to move the heavy palletized loads from the warehouse to shipping, they are equally well adapted to carrying loads directly into highway and rail carriers. A special design of lifting mast facilitates these operations by combining high lifting ability with low telescoping range.

DON'T MISS WI'S special listing of 40 best portable power tool manuals on page 98. Concise reviews and Reader Service Postcard make it easy for you to obtain helpful aids to portable power tool selection, upkeep and application.

Bricks are manually removed from conveyors in this plant, but operator no longer must stoop or reach to palletize them. Hydraulic lift lowers one step as layer is completed.

Hydraulic lifts boost brick production, reduce fatigue

case history 64

Bend, stoop, pick up a 14 to 18-lb. brick in each hand, rise, place brick, repeat—this five-count calisthenic has been eliminated for off-loading workers at Higgins Brick Co., Alhambra, Calif. Replacing it are eight hydraulic platform production lifts. In addition to relieving taut back muscles, the platform lifts have boosted the plant's production to 100,000 bricks per day.

Produced by extrusion methods, the bricks' formation starts with prepared moist clay which is forced out of a mixer in a ribbon-like continuous slab one brick-length wide and as high as the specific brick being produced. The slab is moved out on a slotted slat-type conveyor, and cycled with a rotating cutter that slices the slab into individual bricks.

Next, the slat conveyor moves cut bricks to a 60-ft. long belt conveyor. About 30 in. above floor level, the bricks were previously removed by hand and lifted to the top of partially built pallet loads, or lowered to just-starting pallet loads. Eight Globe platform lifts supported on large diameter hydraulic cylinders and powered by a central pump unit are doing the work now. Each lift is controlled by a push-button station mounted behind and above the conveyor belt. Platforms on the lifts measure 20 in. x 7 ft. They are arranged in three groups—two groups of three each and one of two—and spaced evenly along the full length of the conveyor. Cylinder stroke permits raising the platform to conveyor height and lowering to 2 ft. below floor level.

Bricks are unloaded at conveyor height and loaded on the hoist platforms until one full layer has been placed. Then the down button on the lift is pressed, lowering the platform by one brick height. This operation is repeated until a full stack is built up. Fork trucks equipped with multiple clamp-bars enter slots left in the bottom layer of bricks, which are by that time dried hard, and move the entire stack to yard areas for further drying.

Fast truck loading with dock boards and portable ramps

case history 65

Loading trucks and rail cars and transporting lift truck loads of beer at the Van Nuys, Calif., plant of Schlitz Brewing Co. have been speeded up by use of portable loading ramps and dock boards.

To expedite loading and unloading operations at rail docks, light weight, heavy-duty, Magliner magnesium dock boards are used. These dock boards insure fast, efficient, and safe transporting of palletized loads by fork lift trucks—not only from warehouse to box car, but from box car to box car where double spur tracks are set for multiple operation. This practice makes it possible to work 15 box cars simultaneously.

At the truck dock area a Magline Mobile Loading Ramp—a light, portable dock-on-wheels, is easily positioned by one man and used for loading and unloading of highway trailers, to and from ground level. The ramp gets double utility at Schlitz, also serving as a bridge between dock and ground level so that fork lift loads can be carried directly up to warehouse level in a minimum of time.

Portable loading ramp is used as ramp from ground level to dock or truck trailer.

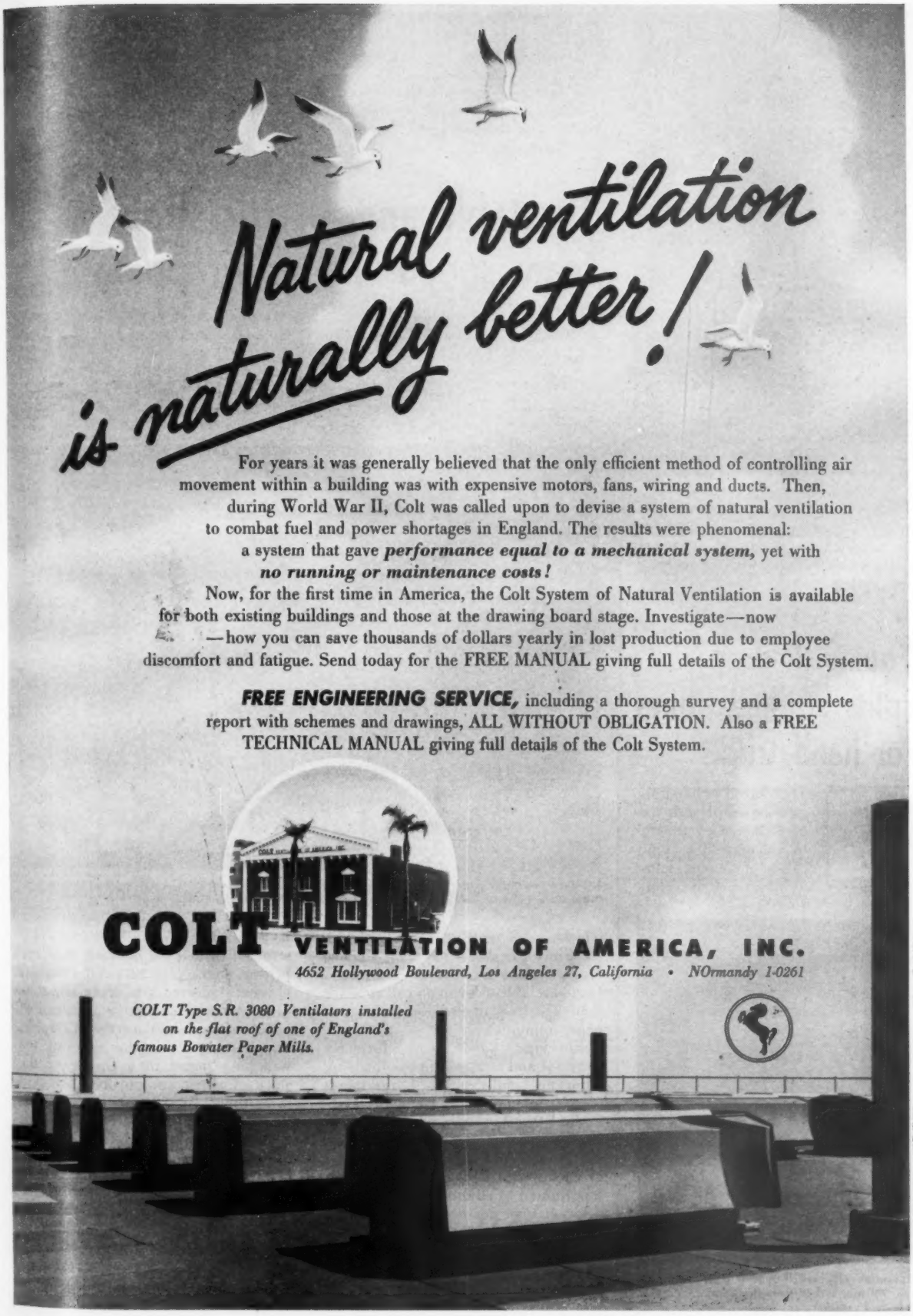
Steel strapping increases log pond capacity 300%

case history 66

Effective use of steel strapping has increased the capacity of storage ponds by 250 to 300% at Umpqua Plywood Co., Roseburg, Ore. Previously, logs were dumped one at a time and tended to float on the surface of the pond, limiting its capacity.

Now, each truckload of logs is secured beforehand with two lengths of 2 x .050-in. heavy-duty strapping which are fed from coil dispensers. Two seals are threaded on each length of strap. Then a new Signode air power sealer takes over.

At the push of a lever, air power crimps each seal, eliminating the hard work of crimping with manually operated tools. Using the sealer also greatly reduces operator fatigue, increases his efficiency and provides uni-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... for more details, circle No. 53 on Reader Service Postcard

Operator fatigue is reduced and strapping speeded with new air-powered sealer.

formerly high joint strength. The sealer operates at pressures which can be supplied by a portable air compressor or any truck with an air braking system.

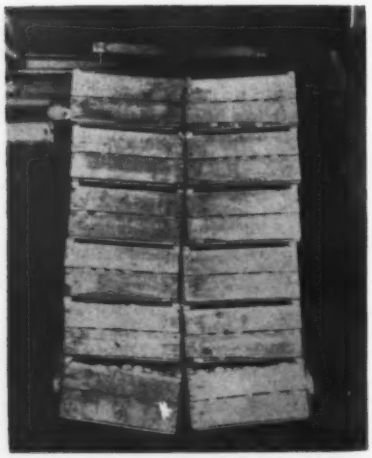
Four-inch drop splits stacked boxes for hand trucks

case history 67

Time saved in handling field boxes of fruit has been increased greatly by an interesting application of a citrus clamp by fork truck operators at the Johnston Fruit Company in Santa Barbara, Calif.

When the boxes are deposited, the fork truck operator opens the jaws of the clamp—a Yale & Towne Manufacturing Co. unit—approximately four inches just before the load is placed on the floor. This action splits the boxes into two separate stacks and facilitates further handling of the individual stacks by hand trucks.

The success of this technique at Johnston Fruit Co. would indicate possible application in any industry where cartons, cases, or boxes are handled by clamps.



Operator releases citrus clamp while boxes are still four inches from the floor, separating the two stacks for single-stack handling.

Turntable and electric strapper team speeds paper wrapping

case history 68

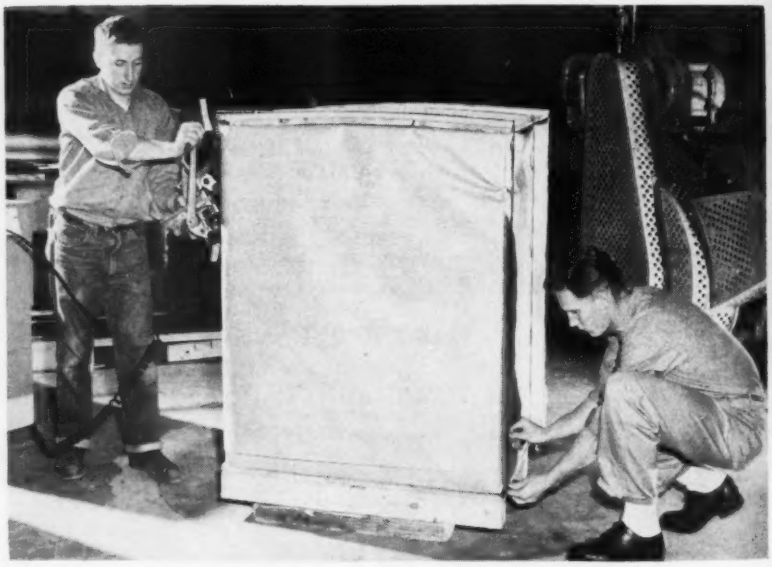
By combining the functions of a floor-flush turntable, stationary spindles holding four-foot rolls of wrapping paper, and a fast electric strapper with pre-set tensioning, shipping personnel at the Camas, Wash., plant of Crown Zellerbach Corp. are able to wrap and strap more than 450 tons of envelope converter paper a month.

Envelope paper was formerly wrapped and strapped in ton-loads by laborious hand methods. Large sheets of wrapping paper were "walked" around the skid. Strapping and sealing were done by hand, leaving the operator to guess the correct tension of each strap. Packaging production was limited to slightly more than one skid per man per hour.

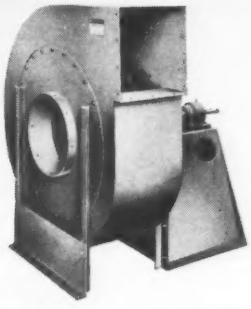
With the aid of a Stanley Steel Strapping representative, Crown Zellerbach set up a packaging system that enabled one man to turn out more than two skids an hour and a two-man team to account for 25 to 30 skids in an eight-hour day.

A steel turntable, 5½ ft. in diameter, was installed flush with the floor. Two vertical spindles for holding rolls of wrapping paper were set in the floor nearby. A mobile cart was constructed to carry a masking tape dispenser, a strapping reel and a Stanley electric skid magazine strapping tool.

Once the skid with its ton load of paper is deposited on the turntable, an operator holds the edge of the wrapping paper to a corner of the stack of paper and revolves the skid three times. After masking the seams, the unit is ready for strapping. Three straps are applied across the skid load of paper and one the long way of the load. Strapping, sealing and cutting are all accomplished by one operator with the powered tool in quick sequence with no lost motion and to predetermined uniform tension. Sealing and cutting of straps is accomplished in one operation by depressing a hand lever.

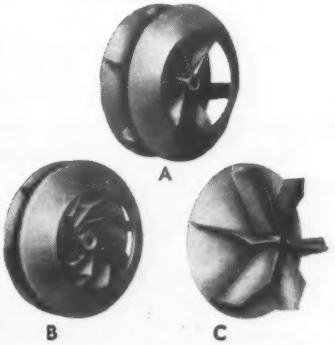


Envelope converter paper is wrapped and strapped at a rate of 450 tons per month using a turntable system. Two-man team can account for 25 to 30 skids per 8-hour day.



Westinghouse Industrial Fans like this — equipped with material handling wheel, serve 150 machining operations at the Formica Plant.

3 WHEEL TYPES FOR:



(A) exhausting and conveying granular materials, chips, sawdust
(B) exhausting fumes, gases and light dust
(C) handling long stringy, fibrous material.

HOW TO GIVE DUST THE "AIR"

32 fan system removes 95% of fine dust generated by 150 micro-sanding and finishing machines.

At the Cincinnati Plant of Formica, a battery of 150 micro-sanding and finishing machines generate enormous quantities of fine dust hour after hour. Unchecked, it would be a health and efficiency hazard, as well as a costly cleaning and maintenance problem.

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New dumper system disposes of reject bottles 80% faster

case history 69

Glass Containers, Inc., in Los Angeles, after taking a long hard look at its bottle disposal system, has come up with a completely new method which has resulted in an 80% saving in labor and provided safer working conditions for employees.

Glass Containers' old system required the full time of two men to pick up imperfect bottles, dump them into bins mounted on skids and take them from the building by a hand lift truck. A fork lift truck picked up the box-skids and dumped them on a storage pile, presenting the danger of flying glass.

Here's how the new system works. All bottles pass over belt conveyors to the inspectors. The inspectors deposit rejects in a hinged tray in a hood directly in front of them, and when the tray is full it is tilted by hand so that the contents fall into a castered box truck standing under the hood. This hood has rubber flaps in the opening, which are pressed aside by the tilted tray, so that each inspector is fully shielded from broken glass fragments.

Rubber flaps at opening of castered box truck protect operator from flying glass as she tips rejected bottle tray.

When the box truck is full it is pushed to the outside wall of the building, a door is opened, and it is pushed into the skip of Colson Equipment & Supply Co. "Cesco" skip hoist dumper standing outside. The door is then closed, for it is interlocked with the dumper so that the latter cannot be operated when the door is open.

Skip hoist dumper automatically tips box truck dumping its content of bottles into large bin with sloping bottom.

This is to prevent any possibility of flying glass getting into the building, or anyone tampering with the dumper.

After the door is closed, by push button control, the box truck is elevated, tipped over and dumped into a large bin having a sloping bottom. A shield around the top of the dumper, with rubber flaps extending into this

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bin, prevents any glass fragments from flying into this area. No broken glass is to be seen anywhere on the floor, either inside of the building or outside. When the large bin is filled it is transported by fork lift truck to the cullet stock pile, lifted above the pile, and by releasing a door the contents are discharged.

Formerly a job requiring shoveling efforts of three men, fertilizer handling is now done faster by one man and a loader.

One operator and a loader do work of three men

case history 70

Handling bulk fertilizer is a hot and dirty job —so much so in fact that Downey Fertilizer Co. in Downey, Calif., was living with the problem of finding laborers willing to work at such drudgery. However, the job is now handled by loader and, as well as speeding up the job and eliminating the drudgery involved, requires the work of two less men than before.

Previous to purchase of the loader, the job was handled by carts and hand shovels and required the full time of three men. Now, one operator and a Frank G. Hough Co. Payloader select from a long line of stockpiles and move into the plant more fertilizer than the three men could possibly handle—and personnel could possibly handle—and personnel stay on the job much longer.

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Incoming pipe is lifted through a hatchway from floor below with this crane. Unit connects as desired with spur tracks providing complete room coverage.

Pipe handling takes 80% less manpower with crane system

case history 71

Pipe handling—at the rate of several hundred tons of ⅛ to 16-in. diameter pipe per month—was speeded up to the extent that only 1/6 former man-hours are required at the pipe warehouse of Palmer Supply Co. in Seattle, Wash. through installation of an overhead transfer crane system. Furthermore, a high rate of labor turnover has been eliminated. Prior to installation of the crane system, the pipe was handled manually—a task so strenuous that Palmer Supply found it difficult to keep men on the job.

A Cleveland Tramrail unit, the one-ton transfer crane travels in the middle bay of the warehouse and connects as desired with spur tracks installed over side bays. Thus, the system's hoist carrier reaches every part of the storage area.

Incoming pipe is lifted from railroad cars by the hoist serving the second story of the building. It is lowered to the shipping level through a hatchway at one end of the warehouse. Outgoing pipe is carried directly from storage to trucks.

One-ton crane carries outgoing pipe directly from storage to trucks. System is faster and less fatigue-causing to warehousemen.

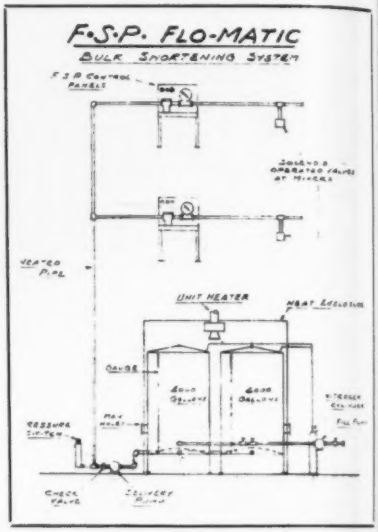
Bulk handling cuts cost of material and labor

case history 72

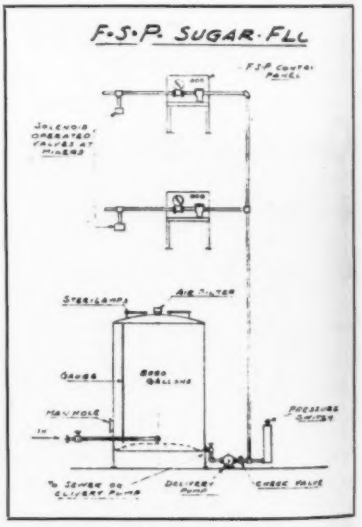
By equipping its plant to receive both liquid sugar and shortening in bulk—tank truck—form instead of smaller drums or sacks, Langendorf United Bakeries is saving $0.26 per cwt. of sugar and $1.50 per cwt. of shortening in cost of the ingredients alone at its 10,000 loaf per hr. plant in Los Angeles. Other savings accrued through use of the bulk receiving set-up are elimination of wastage in material clinging to inside drum surface, labor and time in drum handling, a boost in sanitation factor and an easier-to-control operation.

While the liquid sugar flows easily enough in its natural state, shortening is heated prior to loading in tank trucks. Distance covered during delivery to Langendorf is short enough that the shortening retains its temperature and a viscosity desirable for pumping. Upon arrival at the enormous bakery, the ingredients are pumped into storage tanks.

Liquid sugar flows into the plant's 8,000-gal. storage tank. A Blackmer 35-gpm. pump performs the truck-to-



Storage tanks in shortening system are housed in a heated enclosure so that a desirable viscosity is maintained at all times.



Solenoid-operated valve releases line pressure actuating pump which feeds ingredients as needed.

storage tank transfer. As needed in the mixing department, an operator presses a button on a control console which opens a solenoid valve relieving pressure that has built up in the line connecting storage tank and mixing vats. Upon release of the pressure a pressure switch located near the storage tank actuates a delivery pump that delivers the sugar under pressure to mixing operations.

Sanitation being of the utmost importance in this food processing plant, sterile lamps have been installed in the storage tanks to prevent bacteria formation and the liquid sugar passes through two strainers in the lines to the mixing department.

Two 4,000-gal. storage tanks housed within a heated enclosure receive shortening pumped from delivery tank trucks. Temperature is maintained at 110 deg. in these tanks. Rancidity in the shortening is prevented by maintaining a slight cover of nitrogen gas on the shortening at all times. As the tanks fill up, excess nitrogen gas passes out of the tanks via a vent at the top.

When needed in the mixing department, shortening is pressure fed as needed in the same manner as described for liquid sugar. However, the material in this case passes through three strainers prior to reaching the mixing operation. The transfer lines in the shortening system are heated by an electric cable.

Total cost of this system, which was designed by Ferry Steel Products & Equipment Co. in San Francisco, was amortized over a period of two years. Systems similar to this are in common Western plant use for receiving such bulk products as paint ingredients, inks, industrial solvents, corn syrup and other products formerly received in smaller containers.

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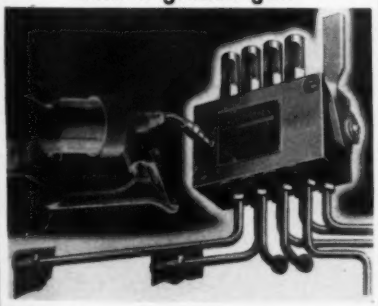
MultiVal System

provides centralized lubrication with a grease gun



• MultiVal provides low-cost centralized lubrication for small groups of bearings. It does not require a permanently mounted central pumping unit or supply line piping.

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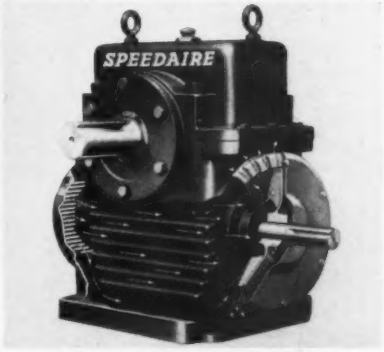

• This fan-cooled worm gear drive delivers up to double the horsepower of standard worm units of equal frame size. It saves weight, space, money.

Speedaire design moves air at high velocities to increase rate of heat dissipation. This and other modifications give Cleveland's Speedaire worm gear speed reducer a much greater load-carrying capacity. As a result, a Speedaire is capable of doing the job of a much larger conventional unit.

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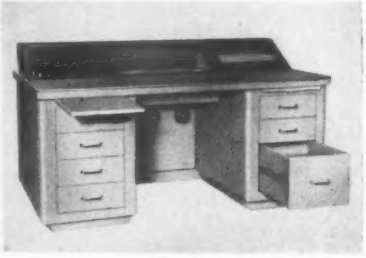

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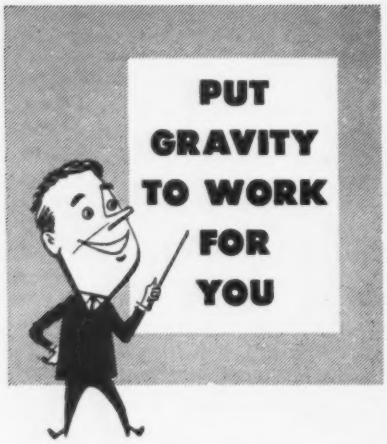
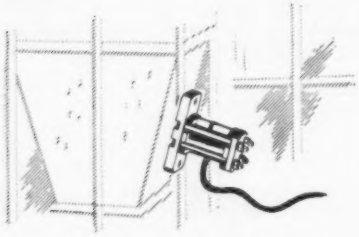


Gravity is the cheapest prime mover available. It will empty bins, convey materials, aid in transportation . . . but it can't solve the problem of handling dry or viscous materials.



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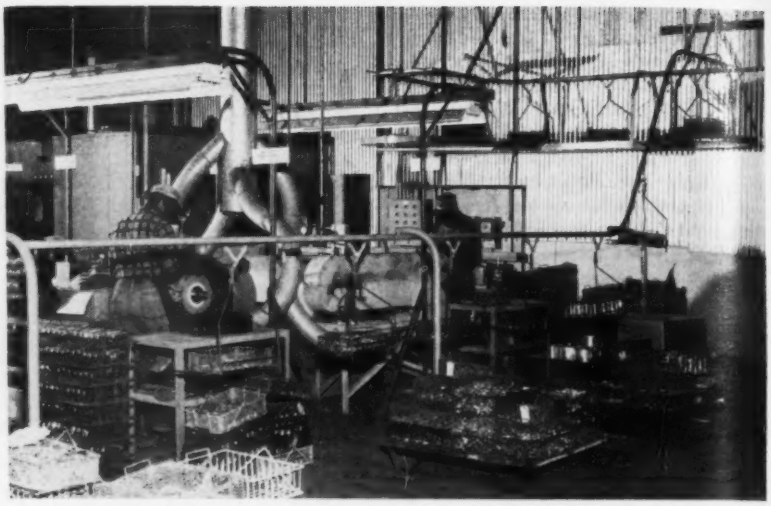


Parts are carried at work level when passing through polishing room at this plumbing fittings and fixtures plant. Baskets are replaced on conveyor after parts are polished.

Intricate shapes handled faster with overhead conveyor system

case history 73

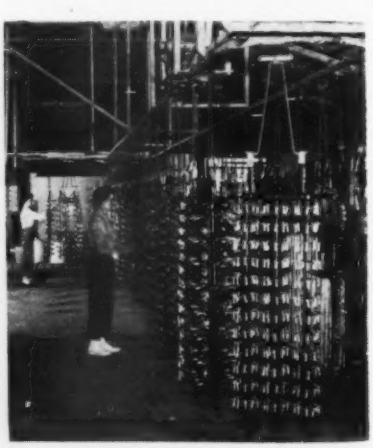
Cost of moving intricate and odd-shaped plumbing fittings and fixtures produced at Harcraft Brass, a division of Harvey Machine Co. in Torrance, Calif., has been reduced greatly and the operation speeded up through installation of a system of flexible overhead conveyors.

Working with engineers of Chainveyor Corp., Harcraft products are moved through the plant via three overhead conveyors. The first unit carries the parts through a polishing setup. Here, machine operators receive the parts at work level contained in wire mesh baskets. After parts in the baskets are polished, the container is replaced on the conveyor.

Next, the conveyor automatically moves the parts through a washing machine which cleans all dirt, grit and polish particles from them. Emerging from the washing machine, the parts continue on to the plating room.

Upon entering the plating room, the parts are removed from the conveyor, inspected, regrouped according to item and racked for plating. A round-table type of rack is used to regroup the parts. These racks are then placed on the second Chainveyor unit which transports the parts through a completely automatic plating machine.

After plating has been completed, the parts are placed on a third overhead conveyor and moved to a final inspection station where they are unracked ready for shipping. Empty racks remain on the conveyor and travel through a chrome strip and water rinse cycle which removes all clinging plating solution and on to the starting point for reloading.



Parts are regrouped in plating department according to item. A second conveyor transports them through automatic plating operation.

WILL MORE DATA on any case histories contained in this issue help you? If so, write to the editors of Western Industry, 609 Mission St., San Francisco 5, Calif. We will be happy to send information along or pass your request on to the appropriate party.

Added bulk storage flexibility speeds handling system

case history 74

Raw material storage facilities have been doubled in capacity and given a much-needed boost in flexibility at Mastic Tile Corp. of America's Long Beach, Calif., plant. It took less than four years for production to put the squeeze on this Western plant's storage set-up.

Design and engineering of both storage and handling systems was done by Stephens-Adamson Manufacturing Co.'s Los Angeles plant. The original system consisted of twin, 100-

Conveyor casings form rigid structural members when assembled. Thus expensive lateral structural bracing has been eliminated here. Three-way discharge gates above direct flow in material.

ton capacity storage tanks fed by a 7-in. L-type Redler conveyor-elevator. Hopper-bottom cars discharged to the horizontal run of the conveyor, where it travels in a shallow trench. A three-way chute at the conveyor discharge point directed the powdered limestone being received into either of the two storage tanks or to processing within the plant. Lime was reclaimed from storage by a short screw conveyor that returned it to the Redler conveyor.

When storage capacity could no longer meet production requirements, a second L-type Redler conveyor, a horizontal-inclined conveyor and several screw conveyors were installed. Another and larger storage tank was also added. The new system was interlocked with the old system so that any combination of loading and

Houston Paper Company, Houston, Texas:

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EASIER TO ERECT | **SIMPLER TO ADJUST** | **COST LESS TO EXPAND!**

Only 3 Basic Parts

WITH EXCLUSIVE **Float Wedge Construction**

Simply insert the Sturdi-Bilt wedge lock
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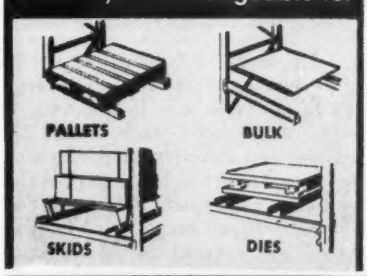

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Less than ½ of 1% of material cost!

The Houston Paper Company, Houston, Texas, was "sold' on Sturdi-Bilt Adjustable Storage Racks the moment they saw a demonstration of exclusive "Float Wedge Construction"!

No other rack could match Sturdi-Bilt's speed, low cost and ease of installation—

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No other rack offered Sturdi-Bilt's flexibility—

INSTANT RESPACING, REARRANGEMENT, EXPANSION OR RELOCATION AT ANY TIME — WITHOUT TOOLS — NO PARTS LOSS!

Looking to future expansion — Houston Paper Company considered Sturdi-Bilt's low cost for add-on storage facilities—

ALL COMPONENTS ARE STANDARD, PRODUCED WITH THE ECONOMIES OF PRODUCTION RUNS!

Write for details of how this new time-saving, money-saving, work-saving storage system can benefit your company, too! Dept. WI-71

*U.S. Patent No. 2760650
Other patents pending

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unloading could be accomplished simultaneously.

Since the powdered limestone is of very fine mesh, it is subject to aeration, a factor which is controlled by design of the system's feed point and the use of web-type flights interspersed with normal skeleton-type Redler flights.

Fully loaded, this multi-tiered caster truck will carry 270 loaves of bread to packaging.

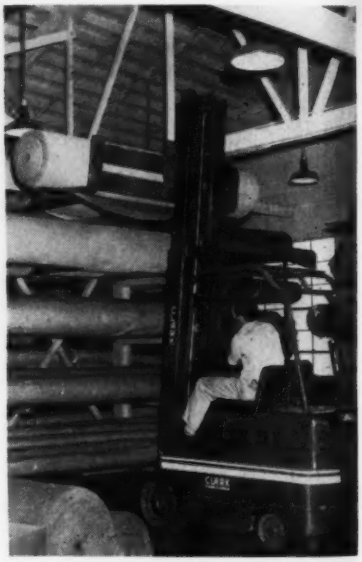
Castered rack trucks up handling capacity 30 times

case history 75

Each worker handling loaves of bread in process at Barbara Ann Baking Co. in Los Angeles is moving 30 times as many loaves since the plant started using castered multi-tier trucks. Clumsy "arm stacking" handling methods have been outmoded and the polished hardwood floors still protected due to plant engineers' smart choice of casters for the units.

Immediately following the baking of the bread and its automatic conveying from ovens, it is loaded on castered rack trucks—each holds 270 loaves—and moved to temporary storage area where trucks are parked side by side to save space. A constant flow of freshly baked bread is fed through a bank of combined slicing and wrapping machines. After packaging, the bread is stacked on wire pallets and moved on bread racks to waiting city delivery trailer trucks.

All steel, welded dollies are used for transfer of empty pallets. Stored end-up and stacked six deep near the shipping doors, the dollies require only a small amount of space when not in use. To protect the plant's floors and still gain savings from the truck and dolly handling system, Barbara Ann engineers selected casters with smooth rounded edges—Faultless Plaskite and Drawn Steel wheels. Both styles of the 4-in. wheels are equipped with close fitting thread guards to protect wheel axles from abrasive action of the poppy seeds used extensively in this plant.



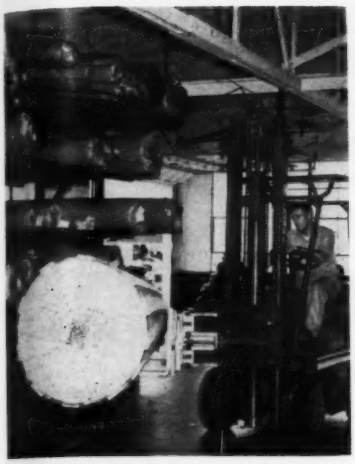
Lift truck handling of carpeting in this plant has saved valuable storage space.

Lift trucks, racks combine to gain storage space

case history 76

Handling 15,000 lb. of carpeting every day is a big job, particularly when you try to do it manually. Prior to a recent change to lift truck handling of both finished carpeting and raw materials entering the plant, Oregon Flax Textiles, a division of National Automotive Fibres, handled all incoming materials manually.

Finished rolls of floor covering average 18 ft. in length and often weigh as much as 1,500 lb. Not only did manual handling of such sizes take a great deal of effort and time, but valuable storage space was lost because it was impossible for workers to



Aisles must only be three feet wider than lift truck with this side-swinging unit.

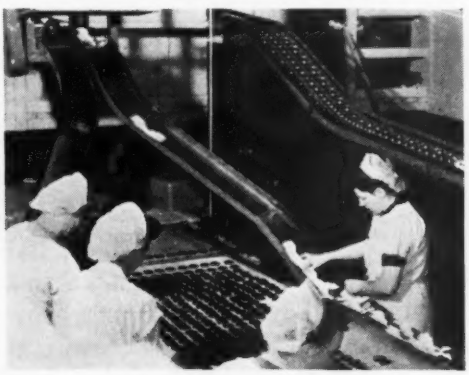
lift the materials high enough to gain on vertical storage space usage. Wrapping operations were also extremely time consuming when packagers had to "wrestle" the large rolls of floor covering while wrapping them with Kraft paper.

Incoming bales of raw materials are now unloaded from rail cars at street level by a gas-powered Clark Carloader. The bales can be stored in the warehouse in stacks up to 12 ft. high and still be quickly moved by the fork truck to cleaning and drying vats for processing.

Finished rolls of carpeting are handled by a similar fork truck equipped with a pivoted fork bar. In the crating and packaging department, this fork truck lifts the long rolls of carpeting onto small dollies to be crated or wrapped with heavy paper. Then the packaged carpet is fork truck-lifted to carrying height and swung, by means of the hydraulically powered pivoted fork bar, into a horizontal position alongside the truck. Thus positioned, the carpet roll requires a minimum of aisle space for movement. On a tight corner, the lift truck operator can maneuver by driving his truck close and adjusting the load swing for clearance on the other side.

Storage has been further simplified by the addition of large storage racks mounted on rollers. Usable due to the plant's change to lift truck-handling methods, the racks can be slid back against the wall when not needed. Stock is stored on these racks with the Clark Carloader and, when filling an order, operators use the fork truck to pull out the appropriate rack and remove the carpeting desired. Once again, the operator swings his load alongside the truck and takes it to the loading dock for shipment.

Ask Standard



how floor-to-floor conveyors helped famous cookie and biscuit maker save manhours, space, handling . . .

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It's another example of how Standard's half century of experience in conveyor application pays off.

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Call the Standard engineer listed in your classified phone book, or write for Bulletin 309 — address Dept. H-1.

50 years of conveyor experience

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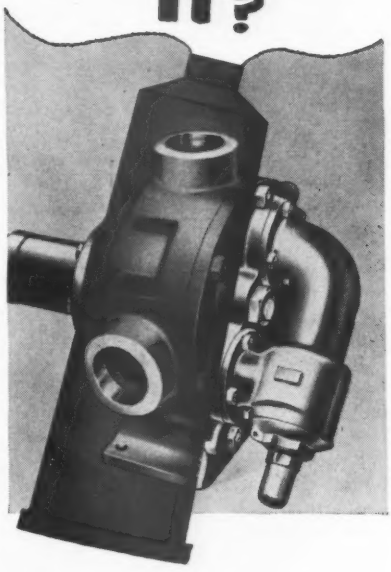

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40 BEST MANUALS ON PORTABLE POWER TOOLS

– yours for the asking

YOUR HANDY SELF-SERVICE LIBRARY this month is made up of how-to-do-it manuals covering a subject of increasing importance in today's manufacturing plants—portable power tools. Portable power tools too often in the past have been little more than "strays" in Western plants.

A headline in the October issue of WI read, "500 workers; 300 portable tools." Quite a tool-per-worker ratio. The article that followed detailed the selection, application and maintenance know-how that one Western plant utilized daily to make that many portable power tools reap high dividends.

All the knowledge applied in that plant, and more, is packed into the 40 manuals reviewed below. Concise and designed for your easy reference, these reviews cover the best manufacturer technical material available. The manuals were collected during the past three months by WI editors in order that this free fund of knowledge could be placed in one big package at your fingertips. They are offered by special permission of the manufacturers who published them.

You are invited to check the listings and select those manuals that appear to offer the most timely help with your production and maintenance problems. Circle appropriate numbers on this month's WI Reader Service Postcard (page 99), and we will be glad to see that you obtain your entire selection promply.

Annual Skil catalog covers 150 portable tools

About 30 different sections of this detailed catalog give data on more than 150 Skil portable tools. Book opens with a page of general information about the Skil on-the-spot advisory service, pricing and ordering, and concludes with a list of the firm's 37 branch offices. Sketches of distinctive parts of tools are included. On accessory pages there are sketches with dimensions for parts such as bits, socket wrench shanks, sockets and finders, etc. *Skil Corp.* . . . **for your copy, circle No. 251**

Drilling and welding with magnetic tools

Four models of portable magnetic drill presses are described by word and picture in this brochure. Models are for general, heavy, moderate and light duty. Specs and up-to-the-minute details are provided on the new V-series of drill presses which have a variable switch for accurate selection of magnetic pull, and a rheostat to allow infinite steps of controlled variation. These models also feature a new pilot light to flood drill point with light and increase operator accuracy. *Buck Mfg. Co.* . . . **for your copy, circle No. 252**

36-page pocket manual on air tools

The 36 pages of this manual present concise data on air-powered balancers, blow guns, drill speeders, clutches, tappers and many other tools, including automatic and Par-A-Matic drills. Accessories described include gages, couplers, balancers, wrenches and adapters. A second 8-page booklet tells how to use multidrivers for speeding up assembly operations, more output and lower cost. Equipment used in this type of tool, essential quotation data, and specifications are included. *Aro Equipment Corp.* . . . **for your copy, circle No. 253**

Uses of power drives with hand pipe tools

In a 16-page brochure about pipe tools, 3 models of power drives are described and illustrated. There are two bench models for use with any hand pipe tools, drop head threaders, cutters, and reamers. The portable tripod model has a built-in folding tray and legs, and supplies ample torque to thread up to 2-in. pipe and rod, and up to 12-in. pipe with drive shaft and geared tools. All feature the Speed-Grip chuck with replaceable jaw inserts. The catalog, which has ordering data and price lists, also shows two bench models of the pipe and bolt threading machine, one having the Speed-Grip chuck and the second, the wrench type. *Ridge Tool Co.* . . . **for your copy, circle No. 254**

40-page application manual on powered screwdrivers

What is an air-powered screwdriver? When does it pay to use them? What types should be used for specific production and maintenance jobs? These are typical questions answered in this basic manual on Keller's air-powered screwdrivers, nut setters, ratchet and impact wrenches, their attachments, accessories and applications. Sketches, photos and text provide a quick education on screw types, air motors, clutch specification, bits and finders, etc., as well as the different types of screwdrivers—angle type, pick-up type, rotary, and so on. Data on nutsetters and impact wrenches parallel the coverage of screwdrivers. Also available is a brochure describing Keller's new positive feed, mechanical drilling attachment—the "K-Matic," adaptable to any air or electric powered hand drill for drilling true holes in hard metals. *Keller Tool Div., Gardner-Denver Co.* . . . **for your copy, circle No. 255**

Condensed guide to Milwaukee line of electric tools

This 12-page notebook insert is a condensed guide to a complete line of electric tools which includes drills, saws, sanders, screw drivers, grinders, polishers, hammers and nut runners. Small pictures of about 40 different tools are accompanied by paragraphs of information and specifications in chart form. Current prices for all tools and accessories are given. (Catalog G7-10) *Milwaukee Electric Tool Corp.* . . . **for your copy, circle No. 256**

24-page guide to evaluating drill set-ups

Featured in a 24-page booklet about automatic drilling tools is an 8-page guide for evaluation and improvement of automatic drilling set-ups. The remainder of the presentation contains pictures, drawings and specifications for models of drill units, drill heads and drill grinders, with accessories for each. *Dumore Precision Tools.* . . . **for your copy, circle No. 257**

Data book on portable power assembly tools

An explanation of the screw thread principle, beginning with Archimedes, opens this 34-page booklet, which tells about screwguns, screw drivers, impact wrenches and tappers. Three sections are titled "Inside Story" and show labeled cutaways of the tools, with the text giving further explanations. Other features include a table of quick reference data on self-tapping screws, torque specification charts and dimensional data on 90-deg. angle heads shown by drawing and table. *Black & Decker Mfg. Co.* . . . **for your copy, circle No. 258**

BEST PORTABLE POWER TOOL MANUALS ... cont.

Users' guide to drills, screwdrivers, abrasive tools

Three catalogs, one of 18 pages and the others of 14 pages each, give descriptive data on three categories of power tools. The first, dealing with drills, outlines different types such as midget, heavy duty, angle, coal and corner drills. Specifications and illustrations are given for these, as well as tappers and tube rollers. The Mag namatic line, featuring the one-shot clutch, is covered in the second book, which has a two-page selection guide for users of screwdrivers and nut runners. The inter-changeability of tools and accessories in this line is emphasized. The third pamphlet, devoted to air abrasive tools, includes photos and dimensions for die, small wheel, straight, heavy-duty, Port-A-Belt, vertical and angle grinders. Sanders and polishers, reciprocating saw-files, wire brush machines and accessories are also covered. *Chicago Pneumatic Tool Co.* **... for your copy, circle No. 259**

Notebook on electric tools for industry

This well-indexed catalog covers nearly 30 kinds of tools, plus many accessories for drills, grinders, saws, shapers, shears, etc. In the 36 pages are sections illustrated by photos and drawings, with dimensions for many tools such as shapers, cutters and router bits. In the page on grinding wheels and rotary files, 24 types of the latter are shown, at about ¾ size. A separate four-sheet price list is included, and another 8-page booklet gives technical information on the Stanley veneer trimmer, for both flush and bevel trim. Featured with this tool is a package deal which includes the trimmer, plus a special kit with router bit, sub-base, underguide and set-up pin. *Stanley Works.* **... for your copy, circle No. 260**

120 pages on electric and air tools

The first of these two books, covering 40 pages and 18 main sections, tells about all types of Thor electric tools. The section on drills includes such types as those of ¼ to 1¼-in. capacity, plus coal drills, wall type drill kits, drill stands and saw attachments. Other sections cover impact wrenches, saws of all types, grinders, sanders, polishers, and valve tools. Specs and many pictures are included in this, as in the second catalog which contains 80 pages. Air tools of all sizes and types are described in this book, and several tools are shown in cutaway drawings. It concludes with photos of the four Thor factories, and a list of branch offices. *Thor Power Tool Co.* **... for your copy, circle No. 261**

40-page manual on screwdrivers, fixtures

A 14-page section on three types of screw driving machines opens this 40-page book, which also treats fixtures, hopper units, nut drives and special assembly machines. Large pictures of different types and models of screwdriving machines are accompanied by specifications and dimensional drawings. A helpful chart for identifying nomenclature of various types of screws, such as wood, machine, tapping and recessed head styles, completes the section. Similar treatment is given to each of the five sections in the book. Brief information about the company is also included. *Detroit Power Screwdriver Co.*
... for your copy, circle No. 262

32-page manual on 69 Porter-Cable tools

This 32-page 1957 catalog describes 69 portable electric tools and kits with over 400 accessories. More than 150 pictures of tools and their uses are included, with complete specifications for electric saws, sanders, drills, planes, routers, shapers, combination tools, grinders, hedge shears and grass trimmers. A four-page separate price list comes with the catalog. *Porter-Cable Machine Co.* **... for your copy, circle No. 263**

Pony sized power drive of work horse capacity

Eleven on-the-job pictures show this portable power drive in action. The 4-page leaflet includes a drawing with outstanding features checked, and a table of die stocks adaptable to the tool. Among the suggested uses are for operating hoists, winches, tapping machines and earth augurs, and opening and closing valves. *Toledo Pipe Threading Machine Co.*
... for your copy, circle No. 264

Four magnetic tools for drilling, welding

A brief but fact-filled leaflet introduces the Mag-Tool line of drill presses, welding fixtures and plate clamps. Distinctive features of the drill presses, such as micromatic adjustment and adaptability to various jobs are pointed out. Application pictures, prices and specifications are given. *Magnetic Tool Corp.*
... for your copy, circle No. 265

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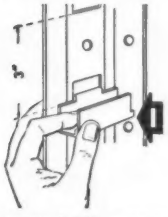
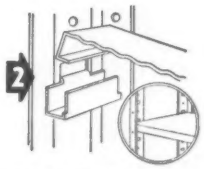


Insert shelf support bracket . . no fumbling with studs, bolts, nuts or lock washers.



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BEST PORTABLE POWER TOOL MANUALS ... cont.

Four pneumatic hammers for industrial applications

A four-page leaflet details four different pneumatic hammers for industrial use, including a light weight rapid impact hammer, a medium duty hammer for riveting operations, an all-around hammer for general use, and a special heavy duty tool. Each is pictured and described while application photographs illustrate the tools in use. Two supplementary sheets give prices for the hammers. *Jiffy Air Tool.* **. . . for your copy, circle No. 266**

Guide to automatic multiple nut runners

This picture-poster guide to automatic multiple nut runners shows both a single and assembly line nut running operation and the equipment needed for both. Special features and specifications for each type are given while a complete nut runner layout accompanies the section on assembly line operation. Half a dozen suggested designs for as many uses round out the brochure. *Ingersoll-Rand Co.* **. . . for your copy, circle No. 267**

17 cuts in 17 minutes shown in picture book

How one multi-purpose cutting machine can make 17 popular saw and dado cuts in only 17 min. is graphically brought out in a 15-page picture book. Time elapsed for each job, and for an additional 17 more intricate cuts, is given in the text with each picture. Savings in equipment costs, floor space, and layout and marking time are explained. *DeWalt, Inc.*
. . . for your copy, circle No. 268

Notebook on five types of power tools

A 24-page booklet, punched for notebook insertion, gives information on a complete line of electric hammers and hammer drills, electric saws, gasoline hammers, electric drills, and concrete vibrators, floats and compactors. Each tool is treated in a separate section with illustrations and text which explains special features of each model. Over 50 application pictures for the different types of power tools are found in the booklet. (Catalog 568) *Syntron Co.*
. . . for your copy, circle No. 269

. . . for more details, circle No. 65 on Reader Service Postcard

Portable air tools and their maintenance

Assembly tools, grinders, hammers, rammers and drills are described and pictured in the first of two booklets on portable air tools and their maintenance. The eight-page presentation, designed to open out flat, makes for easy reading and checking. Over twenty models of assembly tools are listed, and the types of grinders shown include small wheel, straight and vertical. The drills are of ¼ to 2-in. capacity, reversible and non-reversible. There are 3 scaling hammer models. 15 chipping hammers, and 6 kinds of sand rammers. "Keep 'em Working!" is the title of the maintenance booklet, with a two-part index slanted for both the maintenance and electrical engineer. Humorous drawings, a grease-amount guide, labeled cutaways of 180 and 360-cycle tools, and paragraphs on inspection, heating cables, wiring and safety provide helpful data. *Rotor Tool Co.* **. . . for your copy, circle No. 270**

Cost cutting with portable power fastening tools

A powder-actuated fastening system which uses a portable power fastening tool is described in a leaflet on plant maintenance. The efficacious and cost-reducing system employs three integrated units: a tool, a power charge and a fastener. Some of the 12 applications described are on conduits, bus ducts, surface raceways, sprinkler pipes and tool cribs. An accompanying architects' file on the subject presents a series of engineers and underwriters' reports on the system, with tensile and shear values on fasteners included. *Ramset Fasteners, Inc.* **. . . for your copy, circle No. 271**

Basic data book on portable electric tools

This 24-page booklet presents basic data for about 10 different portable electric tools, including drills of different sizes, saws, sanders and grinders. A large picture of each model is shown and accompanied by a descriptive paragraph. Principal specifications accompany each model. A final section points out special construction features of some of the power tools while an accompanying four-page brochure gives a complete price list. (Catalog P2) *Portable Electric Tools, Inc.* **. . . for your copy, circle No. 272**

Facts on chipping machines and flexible shafting

Two brochures, one confined to the rotary chipping machine, and the other covering flexible shaft machinery, give concise data on these power tools. Booklet on the chipping machine shows attachments for removing dirt and paint from brick or cellar walls, smoothing worn cement steps, performing tough cleaning jobs and even stripping bark from logs. Second booklet describes the range of products using flexible shafting and includes the Econoflex single-speed series for machine shops. Other types are single-speed heavy-duty and multi-speed for medium and heavy-duty. Wheel guards, buffing wheels, wire brushes and sanding drums are among applications listed. *Elliott Mfg. Co.*
. . . for your copy, circle No. 273

Data sheets, price list for air tools

Four data sheets describing the Air-Speed lubricator and a pneumatic combination saw and file give information about these tools and their accessories. Application pictures illustrate the saw in operation for varied jobs, and its individual parts. Specifications include the kinds of high speed blades adapted to the tools. The lubricator and filter, which comes in two models, is illustrated by a cutaway drawing which also shows how to fill, increase oil flow and decrease flow. Accessories for the cutting machine are air volume control regulators, carbon scrapers, and a valve grinding attachment. Prices for all items are given in an accompanying list. *Air Speed Tool Co.* **. . . for your copy, circle No. 274**

10 reasons for using supplementary power tools

The advantages of teaming standard industrial power tools with special-purpose machine tools is the subject of an 8-page booklet called "Make Up Your *Own* Mind." Ten reasons for the strategic use of power tools in a supplementary capacity are listed, together with 8 photo-illustrated case histories showing results of such use in metal-working plants and foundries. The two-color pamphlet lists and pictures the 14 principal industrial power tools in the Delta line. *Delta Power Tool Div., Rockwell Mfg. Co.*
. . . for your copy, circle No. 275

How to save money with power torque wrench

How the Pow-Or-Tork wrench, and not the operator, "determines" when the desired torque is reached, with resultant increase in safety, accuracy and economy, is outlined in this 4-page presentation. Photos, graphs and drawings illustrate the power torque principle, and the text explains uses for the wrench, such as assembling aircraft engines, fastening plastic bottle caps, tightening railroad track bolts, etc. *Ohlsson & Rice, Inc.*
. . . for your copy, circle No. 276

62-page manual on variety of air tools

Divided into 8 sections, plus 10 pages of maintenance ideas, this book describes and pictures drills, screwdrivers and nut runners, grinders, chippers and scalers, riveters, sand rammers and a large variety of construction tools and accessories. The ten pages on drills open with a cutaway drawing which has labels for all parts. Non-reversible, rotary and air-operated countersink units are included. Section on screwdrivers and nut runners shows 6 models of these tools and 4 types of impact wrenches. All sections include specs and photos of each part or model. *Cleco Div., Reed Roller Bit Co.* **. . . for your copy, circle No. 277**

How to use the stud driver fastening method

A handy pocket reference guide for using stud fastenings contains chart forms which detail ¼-inch stud types and power loads for various thicknesses of steel into concrete, wood into concrete, wood into steel and steel into steel. Similar drawings, with studs pictured at half-size, give data for ⅜ in. and flat head studs for different materials and jobs, including attachment of pre-drilled materials. A page for application notes and one on safety precautions completes the book. An accompanying 8-page leaflet shows the "Mighty-Mite" stud driver in two models. *Remington Arms Co.* **. . . for your copy, circle No. 278**

Special features of powder actuated fastening

"Don't Drill It . . . Drive-It" is an eight-page leaflet which explains the powder actuated fastening method and gives information on tools, drive pins, power loads and accessories for general and industrial maintenance use. Special features of powder actuated tools are listed and illustrated with small sketches. Three pages are devoted to drive pin charts which list all drive pins by catalog number and illustrate them in full size drawings. Accessories are briefly pictured and identified while the final page covers illustrated uses. *Omark Industries.* **. . . for your copy, circle No. 279**

Specs on 7-in. pistol-type hammer

An air hammer and pneumatic tool which measures only 7 in. and fits the hand like a pistol, is the subject of this 4-page data folder. A full-size picture of the Dotmar Air-Ace hammer, with tools for it shown half-size, is included. Six application pictures, with text, give further data. Specs, drilling time, and sketches of the 13 tools to be used with the hammer conclude the pamphlet. *Dotmar Industries, Inc.* **. . . for your copy, circle No. 280**

Manual on complete line of disc sanders, grinders

This eight-page manual covers 10 models of single and double disc sanders and grinders in five sizes, as well as a line of saw sharpening machines. Purpose of the machines and the scope of their applications are included, as well as descriptions and specifications for each model. Booklet is well illustrated with both product and application pictures. *Max Mfg. Co.*
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Torque control tool for nut running applications

A six-page brochure introduces the torsion bar Impactool for precision torque control for all nut running applications where a prescribed torque must be met. Application pictures show how the tool can be used while graphs give performance data. Advantages of the tools are listed along with specifications and dimension drawings. *Ingersoll- Rand Co.*
. . . for your copy, circle No. 282

Pocket manual on air or electric driven sanders

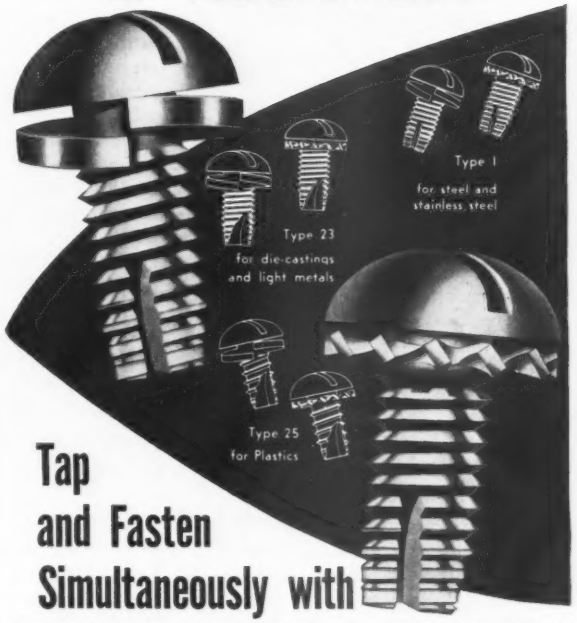
Five models of sanders, using orbital or straight-line action, are detailed in this 15-page manual. Explanation of the action differences is given, as well as specifications and application pictures. Nine types of shoes, pads and other accessories are illustrated. *National Air Sander, Inc.* **. . . for your copy, circle No. 283**

THERE'S STILL TIME . . .

. . . to obtain your selection from among the **50 best lift truck manuals** reviewed starting on page 63 of the December 1956 issue, the **50 best manuals on industrial water treatment** listed in the November 1956 issue on page 66, and the **selected cooling tower manuals** listed on page 74 of the November issue.

Next month, the editors of WI will present a listing of the best manuals available today covering all types of **overhead handling equipment.** If you're planning an improvement in your materials handling system, be sure to see the February issue!

2 OPERATIONS 1 MOTION



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HELPFUL LITERATURE for the West's plant operating executives

FOR YOUR FREE COPIES, circle appropriate key numbers on postcard, page 99

Cost savings tips on fabricated plastic parts

"Fabricated Parts and Components . . . Management Decision for Profit" is the title of a 12-page booklet dealing with cost advantages gained by sub-contracting for fabricated parts made from vulcanized fiber and Phenolite laminated plastic. Designed for rapid scanning by management men, purchasing agents and engineers, it has 36 illustrations on machining operations and products, as well as property and application charts to aid in selection. The value of research, design and engineering facilities is pointed out. *National Vulcanized Fibre Co.*

. . . for your copy, circle No. 151

86-page retaining ring design, application guide

This 86-page loose-leaf notebook on the design and application of retaining rings is divided into three sections for quick reference. Part 1 on theory and development covers stress analysis, load capacities, radii and chamfers, ring development, materials and finishes, while Part 2 on use in mass production discusses suitability to mass production assembly, economic factors, techniques and equipment and installation of the system. Part 3 treats applications to consumer and industrial products manufacturing and is devoted primarily to case histories in fastening. Book is well illustrated with drawings. *Truarc Division, Waldes Kohinoor, Inc.*

. . . for your copy, circle No. 152

Information guide for 100 industrial spray nozzles

Information on more than 100 industrial spray nozzles of all kinds and sizes is included in this 28-page booklet. Pictures of each nozzle are accompanied by descriptive paragraphs while cutaway views illustrate construction and operation. Tables show nozzle capacities at varying pressures, spray angles, nozzle dimensions and other specifications. Special chapters cover nozzles for bonderizing, roof cooling and humidifying while special tables supply information on pressure drops for water in steel pipes and spray cone diameters at various distances from the nozzle orifice. Steam tables for steam condenser, spray pond and cooling tower work are also included. *Binks Mfg. Co.*

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60-page selection guide for metal hose, tubing

This 60-page booklet was designed to simplify selection and ordering of metal hose and tubing for industrial equipment and maintenance applications. It presents design suggestions, metal hose and tubing specifications, gives bend diameters, lengths, types, construction diagrams and descriptions of end fittings. Descriptions and pictures of the tubing and hose made of bronze, brass, steel, aluminum, monel, nickel and plastic are also included. Catalog G-560) *American Brass Co.*

. . . for your copy, circle No. 154

22 case histories of Poly-V drive application

A total of 22 cost reducing applications of Poly-V drives with slush pumps, mine fans, sand and gravel pumps, oil well drills, granite cutters, engine lathes, log barkers, compressors, etc., are presented in this 16-page booklet, which closes with two pages of drawings illustrating 7 design features. *Raybestos-Manhattan, Inc.*

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Guide to help match right plastic to job

A revised 1957 edition of the "Condensed Reference File of Bakelite Plastics" is designed to help engineers and fabricators choose the right plastic for the job. The 16-page booklet gives the distinguishing characteristics, fabricating techniques and major fields of application for six types of plastics: polyethylenes, vinyls, phenolics, styrenes, epoxies and polyesters. About 80 pictures illustrate proper uses of the plastics. A chart, set up by method of fabrication, indicates the variety of plastics available. *Bakelite Co.*

. . . for your copy, circle No. 156

Brief introduction to new G. E. gearmotors

An eight-page, two-color brochure illustrates features of the firm's new fractional horsepower gearmotors and includes gearmotor selection data, dimensions, ratings, and specifications. Cutaway drawings give the inside story of the units. (Booklet 6133A) *General Electric Co.*

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76-page illustrated clutch data manual

A comprehensive 76-page manual presents data on automatic freewheeling clutches, combination clutch-couplings, backstops, and a line of enclosed freewheeling clutch units for continuous operation. Included are 110 illustrations, some in color, together with explanatory schematic layout drawings of installation and operational details. The one-way clutch operating principle is explained and design and construction features of the units given. *Marland One-Way Clutch Co.*

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How to control dust and mist

How to control dust and mist is treated in two presentations, one a standard-size 4-page leaflet and the other, a giant-sized one which opens out to become a bulletin board poster. It contains dimension-labeled drawings to be used in making your own hoods for use with Dustkop units, and further data tell how to design your own system with Dustkop equipment in 32 different models. Vapor control problems are discussed in connection with Mistkop collectors, which employ a specially compressed filter of Fiberglas as a condensing element. Detailed specifications on capacities, sizes, storage space and range of applications are given. *Aget Manufacturing Co.*

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Typical applications of adjustable speed drives

An eight-page brochure discusses the advantages and gives typical applications of adjustable speed fluid drives. Design and construction features are described and illustrated with a cutaway photograph, while close-up photographs of optional speed control mechanisms illustrate the features. Operation of the units is completely described. Selection tables are given for the full line in the 1 through 25-hp. range for both direct connection and belt drive arrangements. Installation drawings are included which give basic dimensions for four new fluid drive sizes for the basic unit and for an arrangement with flange-mounted drive motor. (Bulletin 9819) *American Blower Corp.*

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66-page V-belt drive engineering manual

Users and designers of V-belt drives will find this 66-page engineering manual a quick source for facts and figures. It is divided into three general sections, the first on V-drive selection covering drive service factors, instructions on how to select a stock drive and complete V-belt drive tables for A, B, C, D, and E section V-belts. The drive design section lists drive service factors, and provides "how to design" instructions and data. A general information section provides further data and concludes the manual. Manual is illustrated. *Maurey Manufacturing Corp.*

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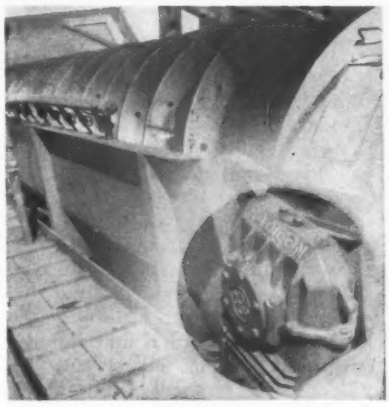

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40-page caustic soda engineering manual

This 40-page manual, "Caustic Soda Engineering and Handling Guide," is designed to promote safe handling and storage of liquid caustic soda. It includes large detailed diagrams and photographs of tank cars, piping and storage equipment, together with recommendations for unloading, dilution, transfer and storage. Sections are devoted to construction materials, safety precautions and first aid treatment. Graphs, charts and tables cover physical data for liquid caustic soda. *Hooker Electrochemical Co.*

. . . for your copy, circle No. 201

Specification book for detachable sheaves

Sheaves ranging in size from 3.4 in. in diameter and weighing approximately 2 lb. to a giant 6-ft. sheave of about 1½ tons, are presented in a new 16-page booklet. Quick-detachable sheaves in 739 different sizes are listed in the illustrated book, with dimensions and weights for all. Instructions for both standard and alternate mounting of shafts on sheaves are included as well as data on hub and keyway dimensions, listing of stock hub bores and keyways, groove dimension and tolerances, and standardized interchangeable hub and sheave combinations. *Fort Worth Steel & Machinery Co.*

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Reference guide to silicone selection

Almost 150 commercially available silicone products are treated in this 12-page, 2-color booklet. Products are grouped by usage, such as water-repellents, dielectrics, release agents, etc., to help you locate a material by its function as well as its composition. Emphasis is placed on charts, tables and graphs which directly compare various silicones with the materials they are displacing. Heavily illustrated, with brief and factual descriptions. *Dow Corning Corp.*

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Series of booklets on floor hardeners

Five folders on floor hardeners are first of a new series of 50 brochures about construction and building maintenance materials. Primary objective of each booklet is to provide detailed product descriptions combined with complete instructions on how-to-apply for best results. The folders are 2 or 4 pages and of standard file size. Each is designed for quick and easy reference, with line illustrations, diagrams and photos to emphasize where the products can be used and methods of application. *A. C. Horn Co., Inc.*

. . . for your copy, circle No. 204

Engineering data on epoxy resin adhesives

An 11-page technical bulletin gives performance data and other information on high strength epoxy resin adhesives for metal-to-metal bonding and honey-comb sandwich construction. Uses of the five representative adhesives discussed include utilizing them as permanent anchors for metal and plastic parts, tool repairing and as sealers and crack fillers. General information, product description, application and curing procedures are also covered in the book. *Minnesota Mining and Mfg. Co.*

. . . for your copy, circle No. 205

32-page booklet on process control instrumentation

Process control instrumentation for indicating, recording, controlling and transmitting flow, pressure, density and chlorination is treated in a 32-page chart and data book, which includes only those units available for immediate shipment. In addition to data on meters, indicators, extensions, receivers, controllers and transmitters, the booklet has a table of instrument weights and sizing charts. Well illustrated with photographs. *Fischer & Porter Co.*

. . . for your copy, circle No. 206

Data on great variety of plastic equipment

Glass reinforced polyester, polyvinyl chloride and Teflon equipment are among the newer products and materials covered in a 32-page catalog, which marks the Haveg company's 25th anniversary. The bulk of the catalog details the firm's corrosion-resistant equipment such as pipes and fitting, valves, fume ducts and systems, towers and accessory supplies, heat exchangers, pressure and vacuum equipment and agitators. A wide range of synthetic resin formulations is covered and there are also data on chemical-resistant cements, the field construction of plastic equipment, and the firm's design service. *Haveg Industries, Inc.* . . . for your copy, circle No. 207

24-page manual on flexible couplings

Torsionally flexible couplings, employing preloaded rubber biscuits as the flexible medium, are described and illustrated in a new 24-page catalog. The development of this type of couplings, and comparison with other types, is explained at the start of the book which gives complete dimensions and specifications on standard, double and radical type couplings. Additional data relate to driveshifts. *Morse Chain Co.*

. . . for your copy, circle No. 208

Facts on low current motor and starter

The 3-step increment motor and starter combination, for use when unusually low current must be drawn from the line at the start, is treated in a 4-page brochure. Featured in the pamphlet are tables showing amperes drawn from line at 208 volts and at 220 volts, with different kinds of starters. *Wagner Electric Corp.*

. . . for your copy, circle No. 209

Application book on liquid-cooled couplings

Eight application pictures, torque tabulation blue-prints and cutaway drawings illustrate this 12-page manual. Section headings deal with application problems, torque characteristics, cooling, basic construction and control, concluding with a summary about the liquid-cooled couplings, which are available in standard units capable of handling from 15 to 1,000 hp. as well as in sizes for up to 20,000 hp. *Dynamic Div., Eaton Mfg. Co.*

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Lighting to protect the eyes in your plant

This industrial lighting booklet, with 28 pages, has sections on safety and visibility factors, standards for use in prescribing plant lighting, uses of fluorescent, incandescent and mercury vapor lamps and data on lighting for specific areas. Maintenance and fixture data are also included. Stressing the importance of good lighting, the booklet outlines the four visibility factors of size, contrast, time and brightness and lists 10 advantages of good lighting. Pictures and charts supplement the text. *Sylvania Electric Products, Inc.*

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Free copies of helpful publications for foremen

Sample copies of publications designed to provide aids and ideas to better the performance of supervisors and foremen in your plant and to make them feel more a part of management are available. They are: "Supervisors Memos & Quotes," a 64-p. monthly pocket memo book with daily and summary note pages, tables, 23 pages of news and safety articles, available at low cost in bulk; and "Foreman & Supervisors," a 6-page monthly newsletter especially edited for these men. If your company were to make these aids available, you can have special pages of your own inserted. *Executives' Service, Inc.*

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Power cranes designed for scrap yard work

A four-page picture pamphlet sketches a line of power cranes designed for scrap yard work and includes a reference table listing capacity ratings and making recommendations for magnet and clamshell bucket sizes. Action photographs illustrate the activities of the cranes. Two rubber-tired cranes and the RailAid crane which can work either on or off its own rail car are described. (Booklet K476) *Koehring Co.*

. . . for your copy, circle No. 163

Notebook spec sheet for cooling controls

This notebook leaflet on self-powered cooling controls gives application data, design features, operation, construction and adjustment ranges for two different types. Much information, as well as list prices, is given in chart form for quick reference. Cutaway drawings illustrate the units; drawings of typical hook-ups are also given. (Bulletin 710-B) *Sarco Co., Inc.*

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36-page booklet on line of metalworking machines

The complete line of Di-Acro precision metalworking machines is detailed in this 36-page booklet, which covers hand and power operated press brakes, benders, notchers, punch presses, rod parters, rollers, shears and spring winders. The Di-Acro process of die-less duplicating is also thoroughly explained. Specifications complete the booklet. *O'Neil-Irwin Mfg. Co.* **. . . for your copy, circle No. 165**

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You *can* with a GENERAL APPRAISAL! It is a factual record of all plant assets, showing insurable values as well as present and replacement values – *positive proof of loss.*

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No other gloves offer so much hand protection in chemicals, acids, solvents, oils, etc. — recognized by officials for prevention of dermatitis, etc. Cuffs up prevent liquids running inside and onto arms—cuffs down provide two inch longer gauntlet, and users report up to 14 to 1 longer service. Better ask your jobber.

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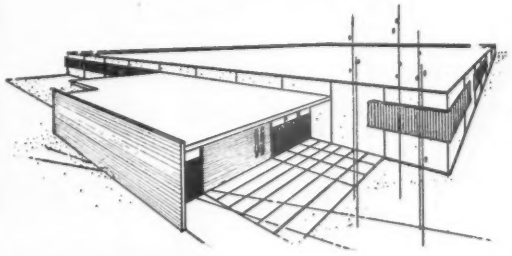

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*** Best for Sub-Zero Lubrication**

Highly recommended for general grease applications on all types of machines operating at very low temperatures. Remains plastic at temperatures as low as 70° F below Zero and has a Melting Point of 270° F. Possesses high film strength and is of a consistency that meets all requirements. Can be easily applied through grease guns or by other means of application. LOW TEMP LUBRIPLATE is waterproof and will protect automotive and other types of equipment against the unfavorable effect of salt or calcium chloride as used on highways during winter months.

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For nearest LUBRIPLATE distributor see Classified Telephone Directory. Write for free "LUBRIPLATE DATA BOOK"... a valuable treatise on lubrication. LUBRIPLATE DIVISION, Fiske Brothers Refining Company, Newark 5, N. J. or Toledo 5, Ohio.

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Data on 1,000 items for sanitation and maintenance

Everything for sanitation and maintenance—soaps, cleansers, disinfectants, cleaning equipment, etc.—is listed in this 36-page booklet. The two-page index includes over 40 departments. Ash stands, brushes, cabinets, dish mops, ladders, gloves, hoses, light bulbs, paper towels, feather dusters, fuses and waxes are a few of the varied items presented. Two helpful pages at the close of the book deal with practical maintenance hints and floor safety. *Easterday Supply Co.*

... for your copy, circle No. 166

32-page data book on annunciator systems

This 32-page manual organizes in 14 sections the complete story of the Panalarm annunciator system. The first three sections discuss company facilities, annunciator function and general features of the systems. Section four illustrates typical industry applications. The balance of the book presents operating sequences, enclosures, mechanical specifications, technical data and performance features of specific systems. *Panalarm Division, Panellit, Inc.*

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The MOST COPIED LIFT TRUCK On The Market
EASIEST WALKIE-TRUCK TO OPERATE AND MAINTAIN EVER!
FINGER-TIP CONTROLS, INCLUDING DYNAMIC BRAKE TO ELIMINATE "PLUGGING" THE MOTOR GOING DOWN RAMPS, AND "ARTICULATED" CONSTRUCTION ADJUSTS TO UNEVEN FLOORS, STEERS EASILY, AND WORKS IN LESS SPACE BECAUSE OF THE DUAL WHEELS & DIFFERENTIAL DRIVE!
HOW ABOUT MAINTENANCE?
SNAP THE LATCH AND LIFT OFF THE COVERS - YOU DON'T EVEN TAKE THE MOTOR OUT TO GET AT THE BRUSHES, AND THE DISK BRAKE HAS A SIMPLE SCREW ADJUSTMENT
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Book tells how to select a-c. motors

A new 12-page motor selector gives full information on how to select a-c. motors for specific applications. Included are such comprehensive selection data as speed-frequency relationship, NEMA design classes, torque characteristics, NEMA current and torque values, frame selection tables, and dimension charts and mechanical modifications for all frame sizes from 182 to 6085. *Reliance Electric & Engineering Co.*

... for your copy, circle No. 168

How to select proper hoisting equipment

A special feature of this 44-page booklet is an article called "How to Select the Proper Type of Hoisting Equipment." Included also are special features and specifications for the firm's line of hand hoists, including the lightweight Load King hand units and Yale spur-geared hoists, the Pul-Lifts and the trolleys in capacities from ½ to 40 tons. *Yale & Towne Manufacturing Co.*

... for your copy, circle No. 169

Forged steel unions for high pressures

Forged steel unions for high pressure service are treated in an eight-page booklet, which presents dimensional and engineering data on the complete line. Types of unions described include 3,000-lb. forged steel for AAR dimensional specifications, two and four-bolt flange unions in 2,000 and 3,000-lb. classes, 3,000-lb. O-ring flange unions, and orifice, clamp ring, forged stainless steel and lug nut unions. Sample units are pictured and all dimensions are given in chart form. *W-S Fittings Division, H. K. Porter Co., Inc.*

... for your copy, circle No. 170

28-page book illustrates, describes gasket line

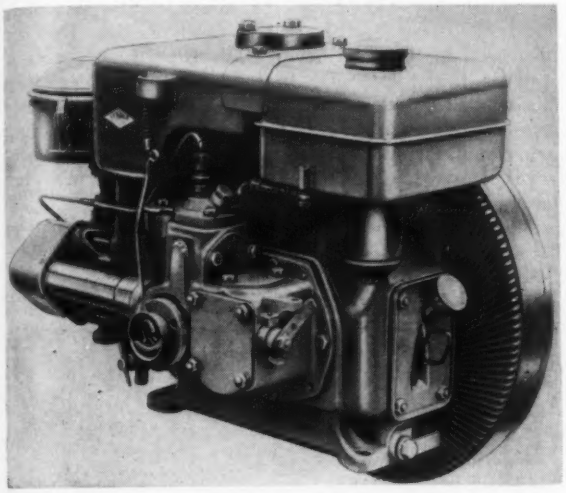
A line of gaskets, shims and washers is described and illustrated in this 28-page booklet which covers a variety of styles, shapes and materials. Included is information on ring, cylinder head, double jacket, corrugated metal, plain solid, self-sealing and special types of gaskets. A special section of the book lists more than 1,500 stock dies which are available. *Chicago-Wilcox Manufacturing Co.*

... for your copy, circle No. 171

NEW EQUIPMENT for Western plant operation, production, and maintenance

USE RIP-OUT POST CARD, page 99, for more information on products described.

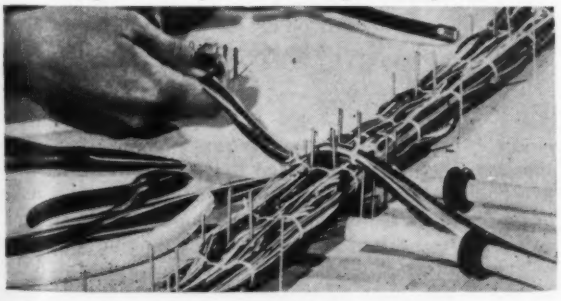
6-HP. DIESEL ENGINE
. . . new to the U. S., has many unusual features



A flywheel condenser cooling system requiring no radiator, fan or water pump is one of many special features of this low-priced diesel engine being imported from Germany. The cooling system requires about ½ of 1% of the total engine power as compared with up to 6% on conventional systems. The Farymann type EK is a four-cycle engine, rated 6 hp. at 2,000 rpm., weighs 187 lb., measures 25 x 14 x 19 in., and is designed to power many types of industrial equipment. Wet-type cylinder liner is nitrided and aluminum piston is fitted with chrome rings. A German Bosch fuel and injector permit operation on stove oils as well as standard diesel fuels. SKF ball and roller bearings eliminate the need for an oil pump and permit simple splash-type lubrication. Standard equipment on the engine includes oil bath air filter, fuel filter, mechanical flyball governor with variable speed control and two-groove sheave on the flywheel. Optional equipment includes 12-v. electric starter, stub shaft with keyway and power take-off clutch. *Lynn Engineering Co.*

. . . for more details, circle No. 172 on postcard

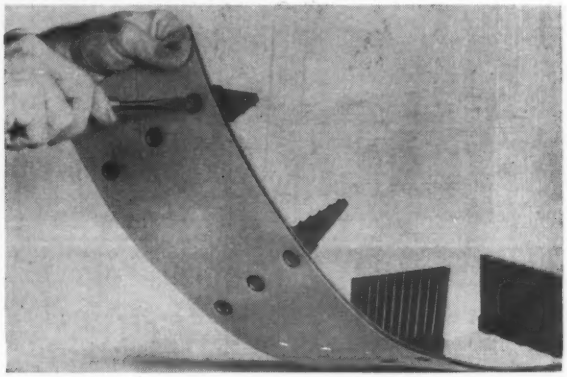
HARNESS BOARD NAILS
. . . designed for pre-assembly, multiple circuits



Designed specifically for harness board wiring applications, a new line of nails can be used in the electric and electronic fields; for aircraft and guided missiles; control panels; switchboards, and wherever multiple circuits are pre-assembled before installations within the main equipment piece. The nails, or posts, have collar-type stops, milled-round tops, and do not require pre-drilled holes. Made of corrosion-resistant cadmium-plated steel, they come in above-collar lengths of from 1 to 3 in. *John Hassal Inc.*

. . . for more details, circle No. 173 on postcard

NEOPRENE SCREW-ON CLEATS
. . . convert conveyor belts



A do-it-yourself mechanic, with only a punch and a screwdriver, can convert any conveyor or elevator belt into a cleated-belt with this molded neoprene screw-on cleat. Flat head machine screws and countersunk washers, which are secured to threaded metal inserts molded in the base and imbedded in concave cups, attach the cleats to the belt. When screw is tightened against washer, it pulls belt into cup, so both screw-head and washer sink below belt surface where they cannot contact pulley. The design features ease of changing cleat width and height, and transfer of cleats to replacement belts. Resistant to oil, heat, mild acids and weather conditions, these Tatch-A-Cleats come in heights from ⅝ to 3 in., in widths from 1½ to 24". *T. H. Hinchcliffe.*

. . . for more details, circle No. 174 on postcard

POLISHING KIT
. . . with 24 rubberized abrasives

A polishing kit containing 24 of the most popular rubberized abrasive polishing wheels, cones, blocks and mandrels has been designed to let manufacturers test abrasives for deburring, smoothing and polishing operations on production and assembly lines, in finishing operations, in tool and machine shops and for repairs and maintenance. According to the manufacturer, these rubberized abrasives will clean, smooth, de-burr and polish hard or soft metals, plastics, glass, ceramics and other materials without damaging under-surfaces. *Cratex Mfg. Co.*

. . . for more details, circle No. 175 on postcard

NOW, Speeds from 0 to 180" per minute

Model VU-120 weighs only 35 lbs. Main wheels run on ball bearings; casters swivel on ball bearings, run on oilite bearings, are shrouded as protection against slag.

Operates at same speeds forward or reverse.

Cuts straight lines, circles, square or bevel kerfs.

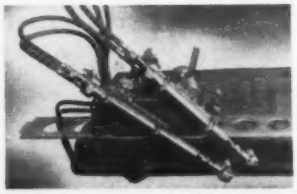
Adaptable to many automatic welding applications.

Now constant running motor and 3-position torque-converter transmission of new Model VU-120 bring you speeds from 0 to 180" per minute—forward and reverse—without loss of power at low speeds. In neutral position, machine free wheels so you can set up easily and quickly. Wide speed range enables you to adapt travel carriage to many automatic welding applications, using either submerged or inert arc.

You get remarkable accuracy from the Model VU-120. Floating rear caster practically eliminates side tilt and wobble. There's no "creeping"—shut off machine and it stops instantly.

Universal torch holder accommodates any model VICTOR machine cutting torch, with or without gear rack. Two torch holders can be used if desired. Case is pre-drilled for extra torch holder, side guide roller, or counterweight.

Try the fast-operating VU-120. Ask your VICTOR dealer for a demonstration on your job NOW . . . or write us for descriptive Bulletin 353.



Torches on Model VU-120 easily angled for bevel cuts. Machine accommodates both 2 or 3-hose torches, and in certain set-ups each holder can handle multiple torches.

FOR MAXIMUM EFFICIENCY AND SAFETY, USE GENUINE VICTOR TIPS AND PARTS

VICTOR for welding

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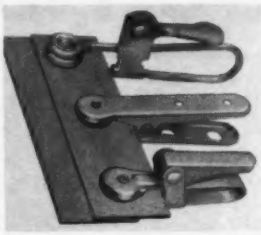
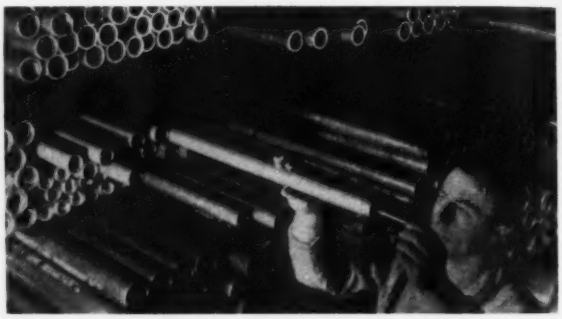
MULTI-PURPOSE CLAMP
. . . for general industrial use



These multi-purpose clamps, called Yates Industrial Handy Clamps, have been designed for general industrial use and can be applied in seconds to metal parts, plastics, templates, molded parts, fabrications or films as they pass along the assembly line. They are also good for dipping, flange work, edge work, bench or wall use. Initial investment in the clamps is small, and they can be used repeatedly. Clamps are available in four basic types: flat spring-steel clamp with cam lever lock, spring grip clamp, spring wire clamp with cam lever lock and conveyor clamp with three-prong sawtooth steel jaws with cam lever lock. *Wedgelock Corp.*

. . . for more details, circle No. 176 on postcard

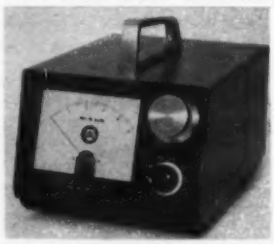
ACCURATE I.D. MECHANICAL TUBING
. . . holds to tolerances for cylinder applications



A comparatively low cost tubing for the production of honed cylinders, one that can be specified to conform to standard tolerances for both outside and inside diameters, is now available from stock. Of cold drawn seamless steel in sizes from 2 to 9 in. O.D., the new tubing made to standard I.D. tolerances so that the inside surface can be honed to the desired degree of smoothness is the first such available, according to the company. *Joseph T. Ryerson & Son, Inc.*

. . . for more details, circle No. 177 on postcard

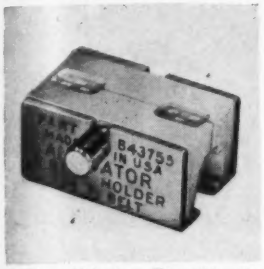
MOISTURE MONITOR
. . . measures moisture in gaseous mixtures



This portable instrument, called the Type 26-301 moisture monitor, measures minute quantities of moisture in gaseous mixtures and was designed to solve problems encountered in research, quality control and process efficiency. It will measure water content accurately down to 1 ppm. and permit precise meter readings over the full range of 0 to 1,000 ppm. by means of a five-step attenuator. The output of the analyzer can be telemetered to a remote recorder for monitoring or control. An electrolysis cell in the instrument continuously absorbs and electrolyzes all water present in a sample stream. A d-c voltage is applied to the elements of the cell and the electrolysis current measured with a multi-range meter. The electrolysis current is used as an indication of water content. *Consolidated Electrodynamics Corp.*

. . . for more details, circle No. 178 on postcard

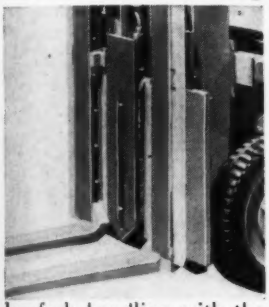
V-FASTENER TOOL
. . . applies fasteners to open-end belting



A pocket sized V fastener tool enables the user to make up V-belts of any length by applying Alligator V-belt fasteners to open end V-belting. Tool is handy for making quick emergency replacements, thereby helping to avoid machine down-time. The tool is made for B and C section V-belts. *Flexible Steel Lacing Co.*

. . . for more details, circle No. 179 on postcard

LIFT TRUCK ATTACHMENT
. . . for safe handling of metal plate



A magnetic attachment for industrial lift trucks has been developed to assure quick and safe handling of metal plate. It is mounted between the forks of the truck and operates automatically when a control switch on the cowl of the truck is placed on the "on" position. Turning the switch "off" permits regular fork handling with the lift truck. The action of the magnet prevents the load from slipping or tipping. The magnet is energized as soon as the load depresses a bar switch located in the middle of the magnetic plate. *Yale & Towne Manufacturing Co.*

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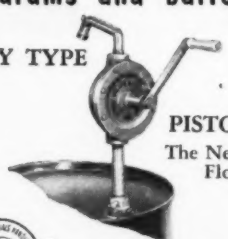
"BLACKMER HAND PUMPS PAY THEIR WAY"—They save time and cut waste in dispensing liquids from tanks, vats, drums and barrels

ROTARY TYPE



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The New Blackmer Flo-Master

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Industrial, Hand and Truck Pumps, Strainers, Pressure Control Valves
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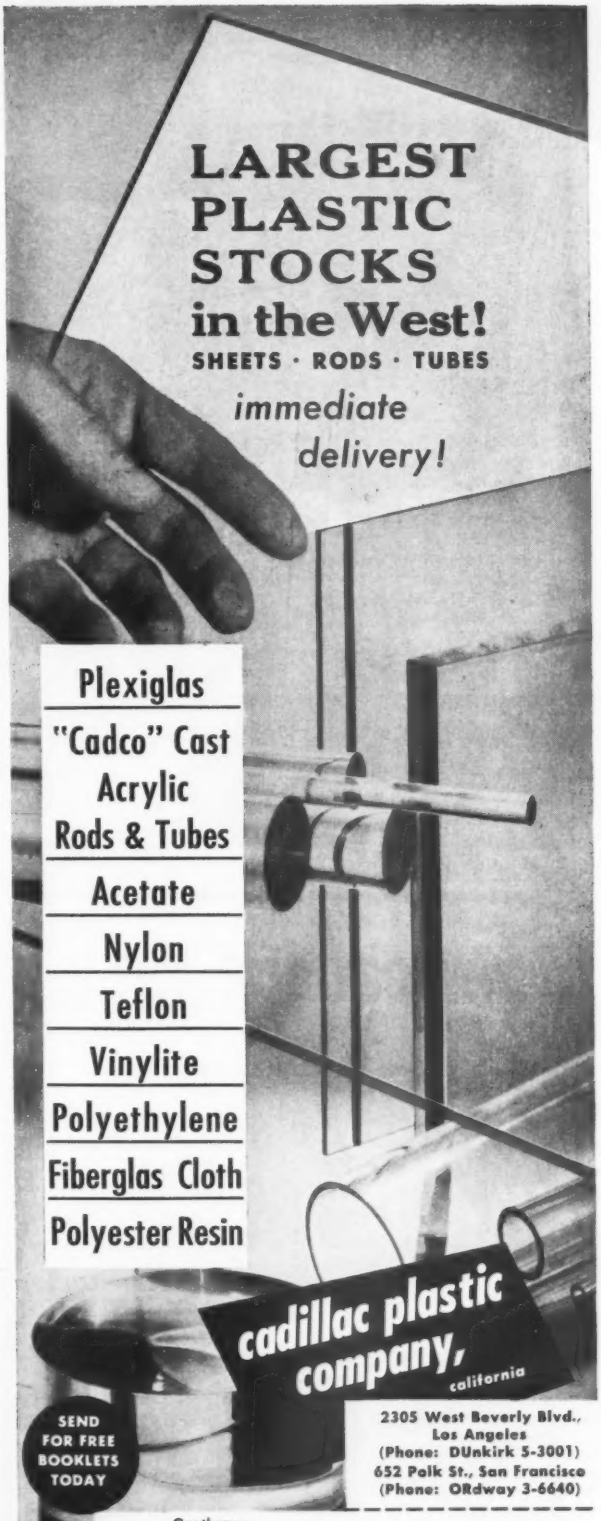

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FRESNO · HONOLULU · SPOKANE 4
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THREAD REPAIR KIT
. . . for general plant maintenance

Designed for plant engineers, maintenance supervisors and equipment repair personnel, this Shop-Pack, or thread repair kit, contains stainless steel wire thread inserts. Twenty-six kits are available, each containing a quantity of inserts, tap and inserting tool in a metal edged box. Sizes range from 6-32 to 1½-6 in. both N.F. and N.C. series. Threads are resistant to wear, corrosion, siezing and galling. *HeliCoil Corp.*

. . . for more details, circle No. 181 on postcard

PIPE THREADER
. . . with automatic drive kick-out

Ridge Tool's geared pipe threader is now available with automatic drive kick-out which, according to the manufacturer, makes it jamproof. The Ridgid 4PJ is said to make threading with power drives as safe as the manual method and die stock and power drive no longer have to be watched while threading. After each standard length thread is cut, the drive pinion kicks out automatically and prevents jamming. Gears are fully enclosed and there are no bushings to contend with. *Ridge Tool Co.*

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including a complete listing of

BRONCO 66 CERTIFIED

flexible electrical portable cords and big cables with 67.32% Neoprene jackets.

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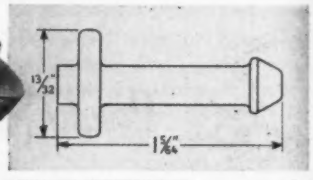
Hassall



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COLD HEADED	$5.20 per thousand
SAVING	$8.80 per thousand

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This is a typical example of how HASSALL saves thousands of dollars for cost-conscious manufacturers in hundreds of industries. This part is made in one piece by cold heading . . . the part is not only lower in cost but also stronger and just as accurate. Savings amount to $8.80 per thousand and this manufacturer used hundreds of thousands a year!

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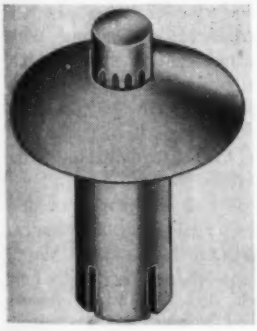
CONSTANT VOLTAGE WELDERS
. . . with arc characteristic control

The arc characteristic control on this line of constant voltage welders enables welders to turn a dial to tune in the arc characteristics that will produce the soundest welds on different kinds and thicknesses of metals. Control of arc characteristics is accomplished with a tapped phase-shifting device. On the 300-amp. model a five-position rotary switch is provided on the front panel for this arc control. Position 1 bypasses the control and the welder operates as a standard constant voltage unit. Succeeding positions provide for arc stabilization at decreasing current loads, permitting the operator to select the characteristics best suited to the job. Operation on larger models is similar. Principal advantage of the control is that it permits a greater range of current density with a given electrode, but it also smooths out submerged arc and open semiautomatic welding on steel. *Metal & Thermit Corp.*

. . . for more details, circle No. 183 on postcard

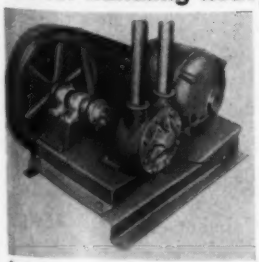
PIN-GRIPS
. . . for rivet type expansion fastening



Pin-Grips, a rivet-type expansion fastener, consist of a slotted, bored rivet body and a knurled pin made up as a one-piece, integral unit. Knurls on the pin hold the fastener together; after expansion they lock the pin in place. When the pin is driven in the bottom of the rivet it expands in four directions exerting a pull-up action and drawing panels together. Pin-Grips, installed from one side of the material only, form a blind head on the other side of the material. *Star Expansion.*

. . . for more details, circle No. 184 on postcard

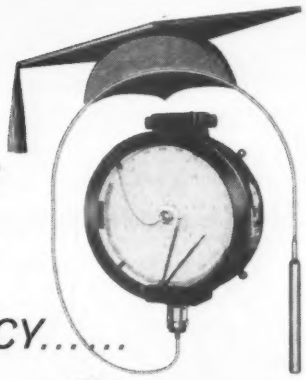
PUMP UNITS
. . . for handling heavy fuel oils



Designed principally for handling heavy fuel oils in industrial and commercial oil burner service, these new Type-SU pump units may also be used for moving any non-corrosive, highly viscous liquid with lubricating qualities. Pump units have either 2 or 4 V-belt drives and are provided for pressures up to 300 psi. and in capacities up to 2,030 gal. per hour. Sub-assemblies of the pumping unit, without drive, are also available. Construction features include ball bearing pillow blocks, flexible couplings, a one-point take-up for belt tension adjustment and multiple V-belt drive for quiet speed reduction. *Tuthill Pump Co.*

. . . for more details, circle No. 185 on postcard

Call PACIFIC SCIENTIFIC



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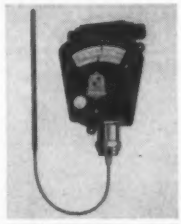

When production processing depends on accurate temperature control, profits may be at stake. And that's where Partlow controls can really pay off!

Low initial cost, combined with fewer moving parts mean long, economical and trouble-free service. Partlow's simple, direct-acting operation and extreme accuracy of calibration provide precision control.

A complete line of Partlow controls is available for temperature ranges from −30°F to 1200°F operation, in recording, indicating and non-indicating types, as well as explosion-proof models for use in hazardous locations.

Send for your copy of Partlow's new condensed catalog with complete information — there's no obligation!

TRADE MARK Pacific

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- Taylor Dixon Testing Machine Co.
- Wilson Mechanical Instrument, and Helicoid Gage Divisions of American Chain & Cable Co.

INDUSTRIAL TESTING EQUIPMENT AND INSTRUMENTS SINCE 1919

. . . for more details, circle No. 82 on Reader Service Postcard

EDMONT CASE NO. 607: For handling oily steel stock and metal parts, a manufacturer had been using canvas gloves that lasted one shift. Edmont recommended a very flexible plastic coated glove with excellent wet grip (No. 404 Snorkel) which averaged 16 shifts and cut glove costs 84%.

Glove costs dropped 84%

No. 404 Snorkel
Fully coated knitwrist

In the case above, glove costs dropped from 27 cents per man-shift to only 4½ cents because the Edmont-recommended "Snorkel" fit the job. Its industrial weight vinyl coating has excellent resistance to abrasion, is liquid-proof, extremely flexible and has an outstanding grip for both wet and dry handling.

Free Test Offer to Listed Firms: Tell us your operation, materials handled, temperature condition. From more than 50 different types of gloves we will recommend the one that best fits your job and send you samples for comparison testing on-the-job.

Edmont
JOB-FITTED
GLOVES

Edmont Manufacturing Company
Dept. W, West Coast Division
P. O. Box 85, Sierra Madre, Calif.

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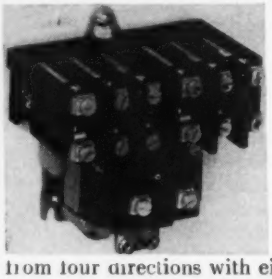
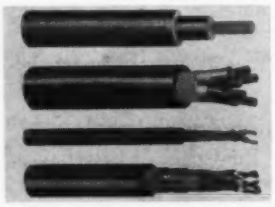
10-AMP. RELAY
. . . for machine tools, control panels



A six-pole in-line 10-amp. relay designed for applications such as machine tools and control panels increases flexibility and conserves panel space by reducing the number of extra relays necessary in automatic control systems. A saddle-type terminal permits wiring from four directions with either plain wire or crimped-on terminal connections. Relay is available in both standard and latched-in forms. All terminals are accessible from the front of the unit. A permanent air gap eliminates malfunction resulting from residual magnetism. Relay is also available in two, three and four-pole models and in all voltages and frequencies up to 600 v., 60 cycles. *General Purpose Control Dept., General Electric Co.*

. . . for more details, circle No. 186 on postcard

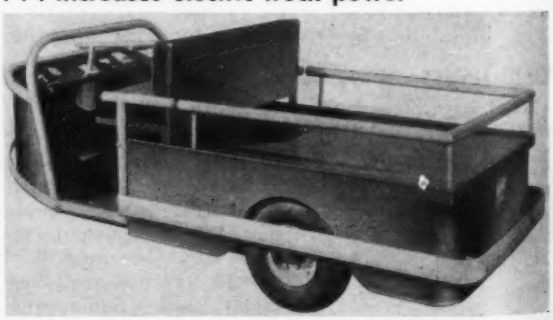
WIRES AND CABLES
. . . for varied industrial uses



Many new types of electrical wire and cable, all suitable for varied industrial uses, are being produced by Western Insulated. Included are two kinds of Type USE, Style RR non-metallic-sheathed 600-v. cable, one suitable for direct burial in the earth and the other a general-purpose cable designed for raceways, ducts or open wiring. Both have a Neoprene outer sheath which is branded with identifying data every 2 ft. Shielded cords are available with two, three or four conductors in sizes 18 through 10. Special cords and cables, called Type P & R, have been designed for use on retractable take-up reels, such as foundry sand cutters, lifting magnets, cranes and mine drills. Many other cables are also available. *Western Insulated Wire Co.*

. . . for more details, circle No. 187 on postcard

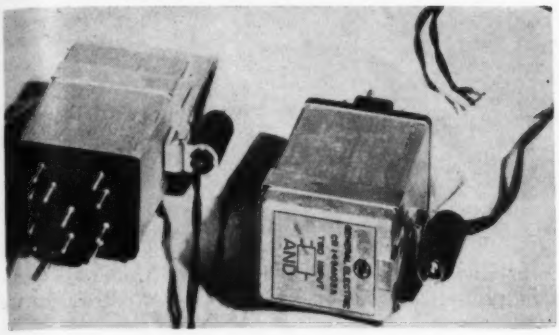
LUB-O-MATIC DRIVE
. . . increases electric truck power



A recently-installed feature of Laher electric trucks is Lub-O-Matic drive with its oil-bath-enclosed switch designed to eliminate 90% of starting and operating problems, according to the manufacturer. Model 7, one of 18 trucks in the line, is an all-purpose battery-operated delivery vehicle, which also features foot and hand brakes, spring steel bumpers, one front-wheel steering and 36-v. d-c. heavy duty ball-bearing motor. *Laher Spring & Tire Corp.*

. . . for more details, circle No. 188 on postcard

STATIC SWITCHING CONTROL
. . . can replace devices making contact



A static switching control system that accomplishes the control functions generally performed by devices that make contact, such as relays, has been designed to aid in the automation of various low-power switching operations. The system makes available a complete line of static components to provide the five logic functions basic to intelligence switching: the "and," "or," "not," "memory" and "time delay" functions. The logic units and associated circuit components provide a tool for performing applications ranging from steel mill processing control systems to the control of individual machines. Fail-safe circuitry is provided in the system. Also, on return of power after any power removal, the control enables the circuit to resume operation at the same point in the cycle where it left off. *Industry & General Purpose Control Dept., General Electric Co.*

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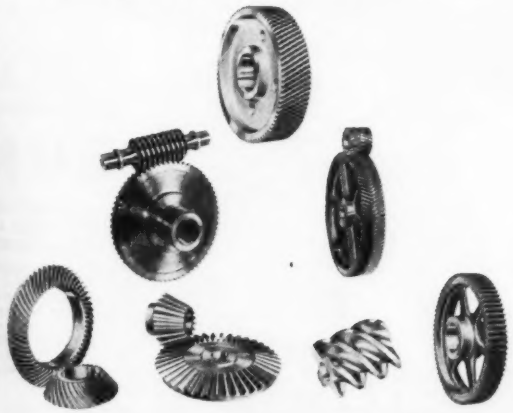

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BERKELEY 10, CALIFORNIA

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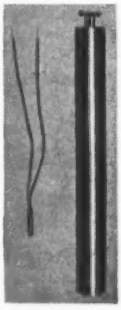
- Sealed End Construction

Available in a complete range of types and sizes, wattage requirements, and voltage conditions—for maximum safe surface temperatures of 750°F. and 1000°F!



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for Dies, Molds, Platens, Sealers, Defrosting

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Standard sizes from ⅛" to 1⅞₆" diameter, and 1½" to 22" in length, are supplied in a range of wattage requirements for 110 and 220 volt operation.

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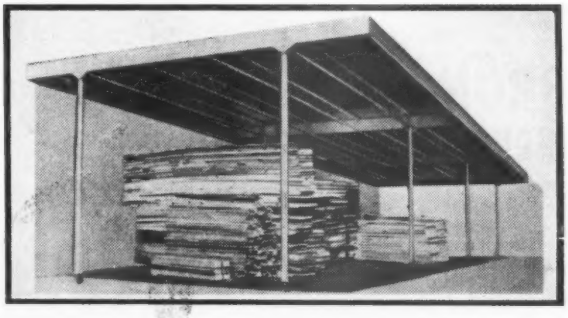
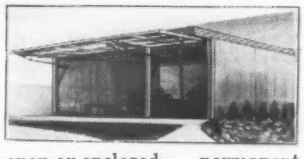
DEAD YARD SPACE INTO WORK AREA IN HOURS . . NOT DAYS . . AT LOW COST



PROTECT . . . materials
. . . work in process
. . . men and equipment
EXPAND . . . PRODUCTION . . . SHOP AREA



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Wilco Steel-Bilt All-Purpose Shelters allow for growth and changes of your requirements.

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BRONCO PRODUCTS CO. 717 Stanford Ave. Los Angeles 21, Calif.

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SEMI-AUTOMATIC ACCESSORY

. . . for spot and tack welding

This semi-automatic spot and tack welding accessory is available in kit form or as a factory installed accessory on current models of General Electric's Fillerarc wire drive unit. Set consists of a gun adaptor kit and control. Gun kit includes locating plates for butt corner and fillet welds and can also be adapted for other configurations. A screw-on nozzle and protective plates are also provided. Controls for the unit, mounted on the door, consist of a timer, an on-off switch, and a slow-fast switch. In use the operator places the gun in position and pulls the trigger, which starts the electrode wire feed and gas. As soon as the wire touches the work, the arc is struck, tripping the timer, which stops the weld after the pre-set time delay. *General Electric Co.*

. . . for more details, circle No. 190 on postcard

IRON POWDER ELECTRODE

. . . gives shallow rippled, smooth weld deposit

Particularly designed for areas where out of position welding is encountered, the Airco Easyarc 10 is suited also for use with plain- or galvanized-surface tanks, field construction, and shipyards. According to the manufacturers, it is the first iron powder electrode developed to meet the AWS-E-6010 classification requirements. Using normal techniques and normal arc length, it deposits in all positions including vertical down. *Air Reduction Co.*

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THE INDUSTRIAL WEST ON ITS WAY

plants • production • distribution • personnel

GUIDELINES

JANUARY 1957

- **ONE LOOK INTO THE FUTURE** is provided by Fibreboard Paper Products' recently-announced plans to spend **$50,000,000 to meet an ever-growing market.** While 1956 sales will total out for Fibreboard and its subsidiaries at $126,000,000, President William L. Keady made public early this month a confident belief ". . . that our **sales volume will exceed $175,000,000 before 1961."** His prediction is based on expected population growth. Most of the expenditures will be consumed by cost of new facilities for paper products division. One kraft liner board plant is already scheduled to be built; two other large mills are under study. Raw materials—timber resources—will account for heavy expenditures also.

- **A NEW PAGE IN THE WEST'S GUIDED MISSILE STORY** will be added when the Air Force mans a **$25,000,000 training base** to be built at the Army's Camp Cooke, 65 miles north of Santa Barbara, Calif. It will be the **Air Force's first training base** for intercontinental ballistic missile crews and units. Construction should be underway in March or April.

  Boeing Pilotless Aircraft Division optioned to buy acreage in Central California's San Ramon Valley. If the missile plant is built on this site, it will be used in addition to the now-vacant Ford plant in Richmond, Calif., which Boeing optioned last month.

  And Convair will build a 1,000,000-sq. ft. depot in Rose Canyon, Southern California, to centralize warehousing and release space for Atlas intercontinental ballistic missile and aircraft production. **Cost: $4,500,000.** Big gains: production space in existing facilities and warehousing centralization.

- **WESTERN PETROLEUM TO GET TWO MORE BOOSTS:** Standard Oil Co. of Calif. has scheduled construction of a **$65,000,000,** possible 100,000-bbl. per day capacity **refinery in Everett, Wash.** Construction should get underway a year from now. Also planned is a 25,000-bbl. per day refinery in Hawaii; start-construction date was not announced.

  A $1,250,000 expansion and modernization of Douglas Oil Co.'s Bakersfield, Calif., refinery will get underway soon. Scheduled for June 1957 completion is a unifining process unit. A new 12,000-bbl. per day topping plant will also be built.

- **A 30,000-TON PER YEAR STEEL ROLLING MILL will go into operation sometime in 1957** at Metalcraft Products Co.'s Lynwood, Calif., plant, reportedly making it the **only completely integrated furniture hardware manufacturer** in the United States. Operation will be controlled by the plant from the billet stage to end product packaging and shipping.

- **SOMETHING NEW ON THE WESTERN PLANT DESIGN HORIZON** will appear when Kaynar Manufacturing completes its **$2,000,000 plant in Rivera, Calif.** All-concrete and with few outside windows, the plant will be **lighted by Kaynar-developed eight-inch "lightports"**—containing prismatic glass lenses—to transmit a high level of uniform daylight illumination on all work areas with a minimum of glare or solar heat gain. Other unusual features include a constantly re-circulated **two-inch layer of water,** which will supplement a refrigerated air-conditioning system and noise-level-reducing acoustical material. Kaynar manufactures a line of curl clips for feminine hair setting and a line of self-locking nuts designed primarily for use in the aircraft and electronics industries.

— News details on following pages —

THE INDUSTRIAL WEST ON ITS WAY
is a special monthly feature of . . .

Western Industry

. . . serving plant operating executives in the nation's fastest growing region.
609 Mission St., San Francisco 5, Calif.

ARCHITECT'S VERSION of new 90,000-sq. ft. plant to be under construction next spring.

Link-Belt to double plant size in L. A.

Present manufacturing facilities in the Los Angeles area will be more than doubled by the new plant scheduled by Link-Belt Co. in Montebello, Calif. Ground will be broken this spring for the factory which will replace and expand the firm's facilities at 361 S. Anderson St., Los Angeles, also housing a factory branch store and district sales office.

The 90,000-sq. ft. Montebello plant on Sycamore St., near Greenwood, will be a one-story structure with air conditioned offices and engineering department. Located on a 25-acre tract, it will include truck docks and railroad siding.

Robert C. Christiansen, southern general manager of Link-Belt's Pacific Divisions, is in charge of the plant and all territory operations. Harvey V. Eastling of San Francisco supervises all the firm's West Coast operations.

DeVilbiss builds factory branch in Los Angeles

Moving into new quarters in Los Angeles is the DeVilbiss Company, manufacturer of spray guns, booths, compressors, rubber hose and other finishing systems components. The new facility, at E. Slausen and S. Garfield Avenues, is five times the size of the former headquarters, on a 50,000-sq. ft. site. A one-story concrete building of natural stone and stainless steel, it houses sales offices and salesroom, warehouse space, service department, rebuilt exchange center and a customer research laboratory patterned after the similar DeVilbiss facility in Toledo. Scheduled for installation in the laboratory are automatic spray machine products for demonstration and customer test purposes, as well as paint heaters and catalytic equipment. George Fulton, manager, heads the Los Angeles branch. J. W. "Pat" Dayton is district sales manager and D. L. Gohon is general manager for DeVilbiss on the West Coast.

Metalcraft plans steel rolling mill in Los Angeles

Metalcraft Products Co. has announced plans for construction of a 30,000-ton steel rolling mill on its property at 12150 South Alameda St., in Lynwood, a suburb of Los Angeles. Scheduled for operation this year, the mill will turn out initially bars, strip, rod and angle iron steel. Completion of the mill will make Metalcraft completely integrated hard furniture hardware manufacturers, controlling operations from the billet stage through all other phases until finished furniture hardware rolls off the line.

The steel mill operation will place the firm in an advantageous competitive position as far as pricing finished hardware, and will also provide control of steel source and quality. Established in 1939, the firm employees 200 persons and produces such items as sofa bed construction, hinges, frames, rails and springs for beds, as well as platform rocker springs and metal crib devices.

Big Standard Oil refinery in Wash.

Everett, Wash., will be the site of a $65,000,000 refinery which Standard Oil Co. of California plans to build. A daily capacity in the range of 60,000 to 100,000 barrels is expected at the refinery to be built on 2,400 acres Standard owns in the Everett area. Construction will not begin for another year, according to T. S. Petersen, president.

A separate year-end statement by R. G. Follis, chairman, predicts that 1957 capital expenditures will exceed this year's $350,000,000, with some 70% to be used again for exploration and production.

Sperry Rand plant slated in Phoenix

Construction of a $3,000,000 initial manufacturing facility in Phoenix, Ariz., by the Sperry Phoenix Corp., has been announced by Sperry Rand Corp. The 81,000 sq. ft. plant is expected to be completed and in operation by August, and about 500 persons will be employed.

Various components of flight and engine controls system will be produced at the plant, located on a 480-acre Deer Valley site. Preliminary manufacturing operations for the company are now housed in 14,000 sq. ft. of leased space at the Arizona State Fair Grounds. A limited number of technical specialists will be employed there, and regular employee recruiting programs will begin later, according to Herbert C. Bostwick, division manager.

Wyandotte Chemicals buys site near Lompoc, Calif.

Wyandotte Chemicals Corp. will set up a plant for production of floor cleaning materials on a 242-acre site recently purchased at LaSalle Canyon near Lompoc, Calif. An oil and water absorbing product for industrial plant floor use will be manufactured at the plant by the company's J. B. Ford division.

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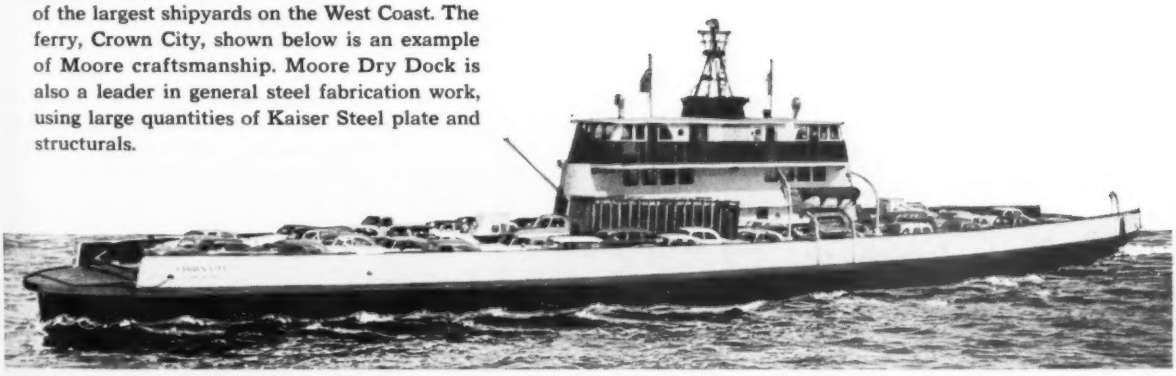
. . . for more details, circle No. 91 on Reader Service Postcard

THEY'RE BUILDING THE WEST

...WITH KAISER STEEL

PACIFIC IRON & STEEL CORP., Los Angeles, has become one of the West's largest producers of long-span roof decking made of steel sheet. The company specializes in standard steel buildings and is a fabricator and erector of structural steel for industrial and commercial construction.

MOORE DRY DOCK, Oakland, operates one of the largest shipyards on the West Coast. The ferry, Crown City, shown below is an example of Moore craftsmanship. Moore Dry Dock is also a leader in general steel fabrication work, using large quantities of Kaiser Steel plate and structurals.



Kaiser Steel

built to serve the growing West

THESE COMPANIES are playing an important role in the vigorous growth of the West. They are among the hundreds of manufacturers, fabricators, and distributors who rely on Kaiser Steel's close-at-hand supply of diversified steel products. To serve these growing western industries, Kaiser Steel is going forward with the largest expansion in its history to place in operation more new steel capacity than was built into the original Fontana plant during the entire war period, 1942-1945.

Steel Mill Products: plates • hot rolled strip and sheet • cold rolled strip and sheet • tin plate • continuous weld pipe • electric weld pipe • alloy and carbon bars • bar shapes • structural shapes semi-finished steels • pig iron • ingot molds • coke by-products • **Fabricating Division:** steel fabrication for construction, aircraft, missile and other industries • expanded fusion weld pipe reinforced concrete pipe • tanks • For specifications, write: **KAISER STEEL CORPORATION** • **Los Angeles** • **Oakland** • **Seattle** • **Portland** • **Phoenix** • **Denver** • **Tulsa** • **New York**

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Two Sure Ways To INCREASE NET PROFITS In 1957

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Check with FELTERS COMPANY for cut felt parts, mechanical and technical felts to any specification; filter felts, decorative felts and specially treated felts—we supply 'em all! (For free 24 page felt design book, check space below.)

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. . . for more details, circle No. 93

AIRCRAFT COMPONENTS are manufactured in Axelson Manufacturing's Montebello, Calif., plant.

$3,000,000 Axelson plant in operation

Recently completed by the Axelson Mfg. Co., a division of U. S. Industries, Inc., was a new plant devoted to the manufacture of aircraft components. The new construction adds 110,000 sq. ft. and more than doubles facilities of the Montebello plant. Featured in the building are removable tilt-up concrete walls which may be re-used in contemplated future construction at the 35-acre site near Anaheim-Telegraph Road. The new facility represents a $3,000,000 expansion for the Axelson division, according to John I. Snyder, Jr., U. S. Industries president and board chairman.

Cadillac Plastics adds Teflon, Sigma MEK lines

Cadillac Plastic Co. of California, with Los Angeles and San Francisco offices, has been named distributor for Raybestos-Manhattan Teflon products and for Sigma Mek peroxide catalysts. The Cadillac firm, first distributor with national coverage for both lines, will handle Teflon sheets, rods, tubes and tapes and, for Sigma, the methyl ethyl ketone peroxide catalysts for cold-setting of polyester and vinyl resins, all for use in auto, aviation, tooling and machine industries.

Kaynar Mfg. builds plant with "light-ports" on roof

Daylight illumination through some 30,000 "light-ports," made of 8 in. diameter glass prisms, is a feature of the flat-roof, pre-stressed concrete plant under construction by Kaynar Mfg. Co. at 7801 Telegraph Road, Rivera, Calif. The lighting units are spaced regularly throughout the roof area providing a high level of uniform daylight illumination with minimum glare or solar heat gain.

Another design innovation is the all year air-conditioning system supplemented by a constant 2 in. thick layer of water in the roof and used in conjunction with some 1,000 roof water sprays. The entire factory and office ceiling contains noise-reducing acoustical material as well as a slim-line strip light system.

The Kaynar firm manufactures women's hair-setting clips and Kaylock all-metal self-locking nuts for aircraft and electronic industry use.

W. G. Ballantyne Co. moves to new Portland quarters

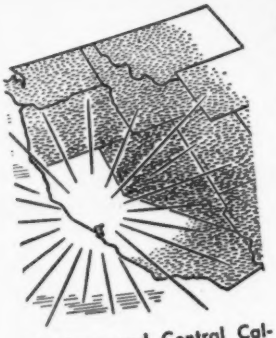
Norman Rupp

Now located in its own three-story quarters at 103 S.W. Front Street, Portland, is the W. G. Ballantyne Co., manufacturers' representatives for power transmission and materials handling equipment. The firm recently announced the appointment of a sales representative, Norman N. Rupp, M.I.T. graduate who has been in the industrial sales field in Oregon and California for the last seven years.

3M will distribute Speed-D-Burr equipment

Speed-D-Burr Corp., Glendale, Calif., manufacturer of precision barrel finishing equipment and supplies, has announced an agreement with Minnesota Mining and Mfg. Co. to distribute the complete line of Speed-D-Burr precision barrel finishing equipment. 3M distributors in 16 cities, including Los Angeles and San Diego, will supplement the present Speed-D-Burr distribution organization in other areas. The new association will enable Minnesota Mining & Mfg., maker of barrel finishing supplies, to offer a variety of on-the-spot services in engineering, processing and technical information. In each of the outlets there will be complete facilities to process parts of various sizes in small or large quantities.

Nuclear reactor facility at General Electric's new Vallecitos Atomic Laboratory, Pleasanton, California



Northern and Central California—marketing center of the Golden West.

One of P G & E's 128,000 new customers this year

More than a million new customers in the last ten years! That's the astounding growth of Pacific Gas and Electric Company (and Northern California—now with 6¼ million population). To serve these new customers with low-cost gas and electricity, P. G. and E. has *tripled* its capacity with an investment of $1½ billion—the greatest expansion in the history of the industry. And we're still expanding!

Why not serve the growing western market from your own western plant? P. G. and E. will gladly furnish plant site information tailored to your needs. A full-color movie—"Golden Horizons"—is also available, covering Northern California's industrial opportunities, superb climate and living conditions. Write: Industrial Development Department, 245 Market Street, San Francisco.

PG and E

Pacific Gas and Electric Company

Some of the famous firms investing nearly $2 billion in Northern California plants since 1945

- Dupont
- Goodyear
- IBM
- Westinghouse
- Ford
- U.S. Steel
- Johns-Manville
- Monsanto Chemical
- Owens-Illinois Glass
- Sylvania

First in a series of P G. and E. advertisements to help bring more industries and payrolls to Northern and Central California. This series is appearing in TIME, FORTUNE, NEWSWEEK, U S. NEWS AND WORLD REPORT and BUSINESS WEEK.

New industrial growth means more business for everyone!

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PIPE, PIPE JOINTS, TANKS AND COUPLINGS AGAINST

CORROSION

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TAPECOAT®
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There's no need to gamble in fighting corrosion. Since 1941, TAPECOAT has proved its ability to give lasting protection on pipe, pipe joints, couplings, conduit, cable and insulated piping—above or below ground. Its resistance to moisture, acids, alkalis, electrolysis, salt water and other severe corrosive and abrasive conditions has established TAPECOAT as the time-tested quality protection to cut maintenance and replacement costs.

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Phone: SYcamore 5-4151

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PLANT MAINTENANCE AND ENGINEERING SHOW—
PUBLIC AUDITORIUM—CLEVELAND
January 28-31, 1957

. . . for more details, circle No. 95

Five-year expansion plan for Fibreboard

At least $50,000,000 will be spent in the next five years by Fibreboard Paper Products Corp., with most of the outlay used on new facilities for the paper products division, according to Fibreboard President William L. Keady in a recent address following a tour of the company's operations in the Stockton area.

Acquisition of more raw material will be high on the capital expenditure program, with the building of a kraft liner board plant and two other large paper mill projects also scheduled. Annual sales of over $175,000,000 before 1961 were also predicted by Keady, who based his figures on expected growth in the area which studies indicate will have a doubled population in the next 20 years.

Portco Corp. announces wooden pallet division

Portco Corp., Portland, announces the establishment of a new pallet division, for the production of wooden pallets in all sizes and grades. Don Swisher is sales manager for the division, which will produce ready-made pallets cut and assembled for specific requirements, and knock-down pallets cut to ordered size and shipped in bulk packages for assembly by the user. Portco Corp. also operates divisions for wood flour, export, and, plastic pipe, as well as the paper and plastics division for production of custom-tailored packaging and paper twines.

Western Paper to build $500,000 Salem plant

Western Paper Converting Co. has announced plans to build a new plant costing about $500,000 in Salem, Ore. The firm purchased the property several months ago.

The new building, which will be 240 x 450 ft. square, will house offices, manufacturing area, storage for materials, storage for finished products and space for printing. Floors will be of reinforced concrete and walls of tilt-up construction.

Acme Steel Plate names So. Calif. distributor

Concrete Tie & Anchor Co., 6550 Avalon Blvd., Los Angeles, has been appointed Southern California distributor of Acme Steel Floor Plate. M. A. Peters, president of Concrete Tie has announced. The multi-pronged steel plate designed for protection of concrete and hard cement mastic floors creates a floor surface combination of 74% steel and 26% concrete, is easily installed and provides traction and a friction surface even under wet oily conditions.

W. P. Fuller erects building at Anchorage, Alaska

The Fuller Paint & Glass Co. of Anchorage, Alaska, will move into its new half-million dollar building early in 1957. The concrete block building, now under construction, covers 26,640 sq. ft., and will provide office space, salesroom, and a warehouse for Fuller products for distribution throughout Alaska.

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When all cost factors are considered, Smoot-Holman's Perfect Vision indirect luminaire will be the choice for commercial, school and institutional lighting requirements. Its revolutionary "new as tomorrow" design gives more light per dollar than ever thought possible... yet continues Smoot-Holman leadership in quality and efficiency.
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WE SUPPORT THE NATIONAL LIGHTING BUREAU
SERVICE IN THE WEST AND SOUTHWEST FOR ALL SCHOOL COMMERCIAL AND INDUSTRIAL LIGHTING

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Air Force plans Calif. missile base

The first U. S. Air Force training base for intercontinental ballistic missile crews will be established at Camp Cooke, Calif., about 65 miles north of Santa Barbara. Construction of the $25,000,000 base will start in the spring, with further expansion later, so that operational facilities will be built which can launch an intercontinental ballistic missile in time of war, according to Maj. Gen. Bernard A. Schriever. For the project the Air Force is taking over about 2/3 of the 86,000-acre Army post.

PIE has new terminals in Nevada, Montana

Missoula, Mont., and Elko, Nev., are sites for terminals recently built by Pacific Intermountain Express. The former combines facilities for both general freight and tanker division activities, and the 2-acre Elko dock has fueling facilities for both diesel and standard gasoline equipment. The Missoula terminal has an 8-door loading dock, 12-ft. utility and drivers' bay, and a 20 x 40-ft. office on its 3-acre site. The building can be extended by 12-ft. bays to any feasible desired length. Branch manager at Missoula is Trand M. Tracy.

At Elko the installation has a five-door loading dock extendable to 72 ft., office space, and dormitory, and recreation facilities for "turn-around" drivers. Leo Robinson is branch manager.

Vickers building $1,000,000 plant

An estimated 650 persons will be employed at the new $1,000,000 Vickers, Inc., plant in Lomita, Calif., where construction has passed the halfway mark. Vickers, Sperry Rand Corp. subsidiary, will manufacture complete hydraulic transmissions systems at the new facility covering 98,000 sq. ft., on a ten-acre site. Address of the new plant and office, scheduled for March 1 completion, is 3201 W. Lomita Blvd. Some of Vickers present operation at El Segundo will be moved and installed in the new plant, company officials said.

Garrett Supply acquires new site in Los Angeles

Plans for new construction twice the size of existing operation-warehouse facilities are underway for The Garrett Corp.'s Garrett Supply Division, Los Angeles. A six-acre land site near the East Los Angeles Vailfield area has been acquired by the firm whose location is now at 3844 S. Santa Fe Ave.

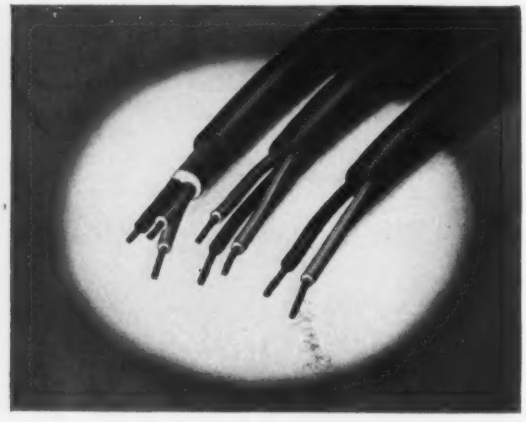
Aro Corp. opens branch office in San Francisco

A branch office of the Aro Equipment Corp. of California has been opened at 221 Eleventh St., San Francisco. All commercial products made by Aro will be housed at this location, as well as personnel of the industrial air tool and lubrication division.

C. L. Erb heads the air tool division, with *E. C. Westly* as his assistant. *R. E. Sanderson* is lubrications division manager, with *David Dion*, assistant. *W. P. Cox* is service manager for both departments.

U. S. Stoneware opens West Coast office

U. S. Stoneware of Akron, Ohio, has opened a West Coast Office at 908 South Atlantic Blvd., Los Angeles. In charge of the unit is Kenneth Bullock, formerly an assistant sales manager for Stoneware's process equipment division in Akron.



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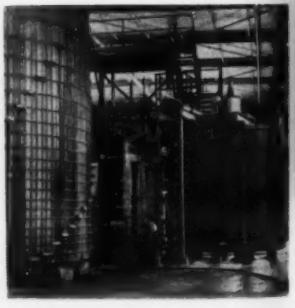

Windeler tanks handle acid solutions economically. Pictured here are three Windeler Built Tanks in a South Dakota uranium mill handling various solutions. At the left is an ion exchange feed (highly acid, pH 1.7) holding tank, large tank at right is a slime tailing neutralization tank and the small one in the center is a lime slurry tank.

Wood tanks also handle acetic acid of 40-80%, sulphuric of 5%, or hydrochloric of 5%. When planning new construction or expansion, plan on wood tanks for economy.

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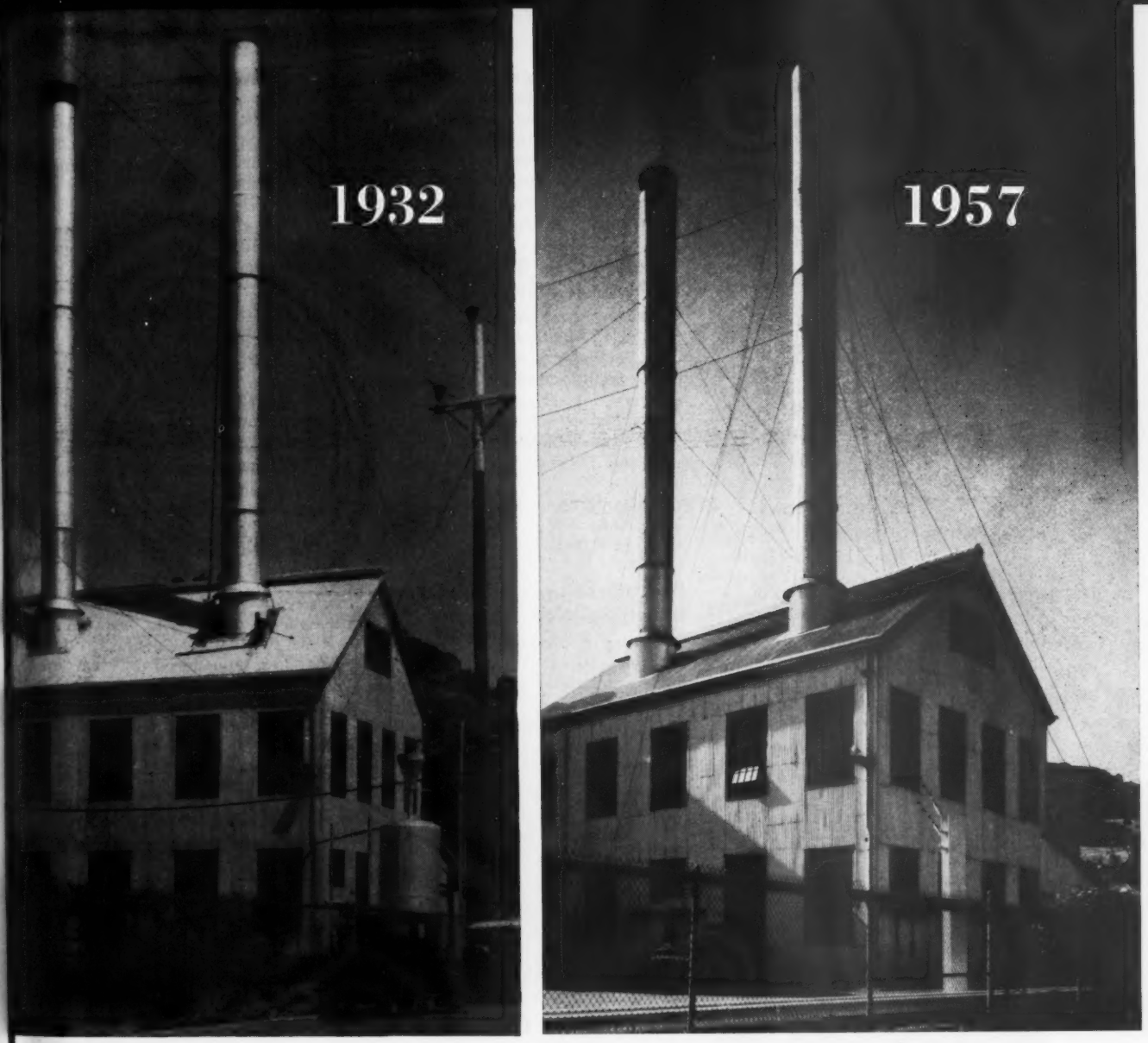

Installed 25 years ago... still in excellent condition... here's another Wrought Iron Plate durability story

After twenty-five years of service over boilers, these wrought iron stacks still rate a "no maintenance needed" inspection report.

These stacks, installed at San Rafael, California, Gas Plant of Pacific Gas & Electric Company, tell the kind of story repeated over and over again whenever wrought iron is used. It's a story of economy made possible because of wrought iron's unique defense against flue gas corrosion.

Byers wrought iron plate is an old campaigner in stack service. You'll find documented evidence of its endurance in our bulletin, *Wrought Iron for Flue Gas Conductors and Coal Handling Equipment.* Clear up a lot of questions about stack maintenance. Write us today for this helpful aid . . . it will pay you.

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Gladding, McBean NW plant underway

Well underway at Mica, Wash., is the construction of a $1,800,000 brick plant, part of a $3,000,000 expansion program of Gladding McBean & Co. The new plant will include installation of a 398-ft. tunnel kiln, new grinding equipment and a new 160,000-sq. ft. dryer. Work on the Mica construction, near Spokane, began in October and the plant is expected to be in production by the end of this year. Presently producing intermediate duty fire brick, the expanded plant will turn out high heat and super-duty refractories. A further addition is scheduled for the manufacture of sewer pipe.

Vacuum Tube firm breaks ground in Oceanside

Ground has been broken for the 13,000 sq. ft. facility of the Vacuum Tube Products Co. plant on East Short St., and Canyon Drive, Oceanside, Calif. After completion of the expanded quarters about Feb. 1, employment is expected to increase from the present 40 to about 200 persons. The firm's engineering headquarters will remain at the present location, 506 Cleveland. Vacuum Tube Products manufactures cathode ray storage and indicator tubes, power rectifiers, xenon thyratrons, motor and welding control tubes, industrial power tubes, as well as vacuum gage tubes and controls, and inter-space electronic equipment.

Ledeen opens $200,000 El Monte facilities

Ledeen, Inc., has opened its new plant in El Monte, Calif., to house its valve, cylinder and pump manufacturing facilities and to serve as headquarters for Engineering Products Co., a Ledeen subsidiary which distributes mechanical power transmission and materials handling equipment.

The building covers 30,000 sq. ft. of space and together with grounds cost about $200,000.

Bearing Engineers named to sell Spirolox rings

Bearing Engineers, Inc., has been appointed stocking distributor for Spirolox retaining rings in Southern California and Arizona. Located at 3511 S. Figueroa St., Los Angeles, the firm specializes in the application and sales of ball and roller bearings and accessory parts.

Spirolox rings, made by Ramsey Corp. of St. Louis, division of Thompson Products, Inc., are used for retaining bearings on shafts and in housings. Stocked in sizes from ½ to 11 in., the rings are available in oil dipped steel, with cadmium plating, or of stainless steel.

Short Run Stamping moves to new plant in El Monte

Short Run Stamping Co. has moved to its new plant in El Monte, Calif., and started operations there on temporary tooling and metal stampings in small lots.

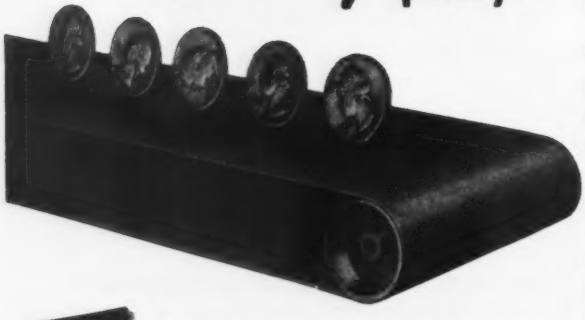
The move doubles the floor space of the company. It now has 15,000 sq. ft. and employs about 70 people.

Hewit-Robins sets up new S.F. sales territory

Creation of a new sales territory to handle the growing business volume of Hewit-Robins, Inc., in the Northwest has been announced by that firm. *Theodore C. Zintner* has been named manager of the new district, which will embrace northern California, most of Oregon and Washington, and

SMOOTH TRAVEL right down the line...

with *Barry* pulleys



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It's a fact! Smoother and better *all around* conveyor performance is yours when Barry Pulleys are part of the system — whether general, package, portable or production line. And there's good reason...

Barry Conveyor Pulleys, with regular or "Quick Detachable" taper bushed hubs, absorb the repeated demands of heaviest work loads without wear and tear on crowns, bearings and other components! Also, *electric welded* end discs keep out moisture and dirt which shorten the service life of other pulleys.

Because Barry Pulleys mount up closer, they form a truly inflexible assembly. And because their design permits ideal lateral alignment, they fit on shafts properly and firmly, without working loose.

Whatever the conveyor application, remember: *better performance records ride on Barry Pulleys!*

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parts of Idaho, Montana and Nevada. Previously this area, to be known as the San Francisco sales district, was served by the company's Los Angeles office.

Zintner, formerly manager of Hewit-Robins' belt sales and development department at Buffalo, N. Y., has played a leading part in pioneering technical advances in conveyor belting and different kinds of industrial hose, which are among the firm's products.

More land optioned for Bomarc plant

Options on acreage in the San Ramon Valley near Parks Air Force Base in central California have been taken by Boeing Airplane Co., which previously optioned the Ford Motor Co., plant at Richmond, Calif. If a pilotless aircraft plant were constructed at the San Ramon Valley site it could be used along with the Richmond plant for manufacture of the Bomarc supersonic long-range pilotless interceptor.

3 M opens new lab and plant in Los Angeles

Opening of the Minnesota Mining & Manufacturing Co.'s newly expanded plant, warehouse and laboratory in Los Angeles brings the firm's investment there to some $15,000,000, and a payroll of about 1,400 persons.

The new facility at 6411 Randolph St. is the fourth major addition to the firm's operations in the Los Angeles area this year. Others include the acquisition of the Zenith Plastics Co. of Gardena, and the formation of a new Mincom division for video tape recording research.

Ryerson Steel has new office building in Spokane

Second major expansion-modernization move of Joseph T. Ryerson & Son, Inc., is a new 4,500 sq. ft. office building in Spokane. The steel and brick one-story structure, begun last May, is located at North 207 Freya St., where the Ryerson steel service plant is operated. First expansion move of the firm after it acquired the plant from Inland Empire Steel in 1951 was the addition of 10,000 sq. ft. at its steel reinforcing division.

L. O. F. Glass Fibers buys 75 acres near Los Angeles

L. O. F. Glass Fibers Co. has purchased a 75-acre site in Corona, near Los Angeles, for plant and warehouse site purposes. Plans for use of the land have not been announced. Pacific Coast division headquarters of the firm are at Burbank, Calif., where thermal and acoustical insulating blankets and shrouds for aircraft are manufactured. The firm has five other plants in Ohio, West Virginia and Texas.

Vac-U-Lift appoints Blair-Martin for sales

Vac-U-Lift Co., Salem, Ill., announces appointment of Blair-Martin Co., Inc., as its sales representative in California, Arizona and Nevada. Blair-Martin offices are at 1010 Fair Oaks, South Pasadena, Calif.

The Vac-U-Lift firm manufactures vacuum operated materials handling equipment used with overhead hoists, cranes and materials handling trucks.

Centric Clutch appoints Hanson as representative

Harold R. Hanson, 11724 Sunset Blvd., Los Angeles, has been appointed sales representative for the Centric Clutch Co. of Woodbridge N. J. Hanson will cover the Arizona, Southern California and Southern Nevada area for the firm's clutch-couplings and clutches.

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SHRINERS HOSPITAL FOR CRIPPLED CHILDREN

This beautiful 60-bed hospital in Los Angeles is one of 17 units supported by Shriners.

Perfectly Safe Floors ...Beautiful, too!

With crippled children of all ages scampering from treatment rooms, to classrooms, and out to play, the floors of the Shriners Hospital must be *safe*. Mrs. Margaret H. Rose, Director of the Los Angeles Unit, selected *Columbia SafeGuard Floor Polish after tests proved *Columbia SafeGuard not only provided maximum safety underfoot but kept floors bright, lustrous and beautiful longer. Maintenance costs actually were reduced more than one-third because *Columbia SafeGuard does not have to be buffed, and damp-wet mops to its original lustre time after time.

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Tailored to your specifications. Prompt service.

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LET US QUOTE ON YOUR PALLET REQUIREMENTS

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Convair will build $4,500,000 depot

Convair has announced plans for a $4,500,000 materials depot in San Diego, with construction of the million sq. ft. building to start immediately and scheduled for completion by 1958. Purpose of the building is to centralize warehousing and release space for the production of aircraft and the Atlas intercontinental missile.

Half the million square feet of floor space will be in a warehouse about 500 x 12,000 ft., said to be the largest steel structure of its kind in the West. A paved and fenced area of about equal floor space will provide for outdoor storage. The depot-warehouse will enable Convair to consolidate materials handling operations now scattered in five off-site storage facilities, the Convair plant and smaller rented buildings.

Fisher Body plant expands in Oakland

Preliminary construction work has begun at the Oakland, Calif., Fisher Body plant, for an expansion program to add 42,000 sq. ft. to the assembly unit. The new addition, scheduled for September 1957, completion, will include 30,000 sq. ft., for body shop operations, plus an employee cafeteria of 12,000 sq. ft. Chevrolet passenger car bodies are assembled at the Oakland plant.

Philip Carey opens Denver factory warehouse

Philip Carey Manufacturing Co. of Cincinnati, Ohio, has opened a factory warehouse in Denver, Colo., to house a consolidated stock of its building products. The warehouse includes 10,000 sq. ft. of floor space, and has facilities for parking and docking trucks.

The new warehouse will permit fast truck deliveries to wholesale customers in Colorado, Wyoming, New Mexico, and points east.

Haskel Engineering moves to San Francisco office

Haskel Engineering & Supply Co., distributor of tube fittings and hydraulic and pneumatic components, has moved from Millbrae to San Francisco to obtain larger office and warehouse facilities. The firm's new address is 225 Eleventh St.

Frank Smith and *Estelle Lake* have been transferred from the Glendale branch to take over the San Francisco office, which has also added two sales engineers to its staff. *Mel Hitchings*

WHAT'S THE BEST WAY TO STRIP METAL PARTS IN LARGE VOLUME?
See page 9

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Do some finishes resist your present stripping methods? Do rejects form a bottleneck in your production line?

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MAX UNIVERSAL DISC SANDERS & GRINDERS

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will cover the peninsula area while *Herman Duemling* will cover the East Bay area.

Douglas Oil announces Bakersfield expansion

Recently announced by Douglas Oil Co. of California was a construction contract to Macco Corp. for the start of a $1,250,000 expansion and modernization of the firm's refinery at Bakersfield. Also scheduled is a new 12,000 barrel-a-day topping plant at Bakersfield that will increase Douglas' capacity for turning out high octane motor fuels.

Leeds & Northrup open Denver district office

A new district office has been opened in Denver by Leeds & Northrup Co., Philadelphia manufacturer of instruments, automatic controls and heat treating furnaces. *W. Arthur Gneiser*, formerly a sales engineer in the Detroit office, will manage the Denver office, which is located in the Denver Theatre Building.

Eitel-McCullough plans receiving tube facility

A new facility for manufacture of Eimac transmitting and ceramic receiving tubes is planned by Eitel-McCullough, Inc., at San Carlos, Calif. Construction of the 150,000-sq. ft. addition will begin early in 1957.

The firm's main plant, where production and research activity are centered, is at San Bruno, Calif. Another production center and microwave tube laboratory are in Salt Lake City, Utah.

Picco, Inc., moves plant to El Monte, Calif.

Now located at 1729 North Chico Ave., El Monte, Calif., is Picco, Inc., which recently moved from its Pasadena facility. Principal products manufactured at the larger plant, which has new or completely reconditioned equipment, are precision investment castings. Powdered metal production continues at Picco's second plant in Sierra Madre, Calif.

U. S. Electronics buys 3 acres for expansion

A three-acre site has been purchased by U. S. Electronics Development Corp. in Glendale, Calif. for new manufacturing facilities. The firm makes precision capacitors, filters, networks, comparison bridges and circuits.

The new location is in North Hollywood, where construction on the first of three 20,000 sq. ft. buildings is scheduled to begin about the first of the year. Production, research, and developmental groups, along with the administrative force, will occupy the new building.

Wallace to represent Connersville in West

G. M. Wallace & Co., Denver, has been appointed field application engineer for the Roots-Connersville Blower Division of Dresser Industries, Inc., Connersville, Ind. Wallace has headquarters in Denver with offices in Salt Lake City, and Butte, Mont.

Territory assigned to Wallace includes Colorado, Wyoming, Montana, Utah, New Mexico, eastern Nevada, and southern Idaho. Wallace will handle Roots' blowers, pumps, exhausters, meters and compressors.

Pacific Clay begins $1,000,000 expansion

A $1,000,000 expansion is underway at Pacific Clay Products in Los Nietos, Calif. Included in the program are a new tunnel kiln and new fast-drying units.

The tunnel kiln, which will cost about $700,000, will be housed in a 600-ft. building and should be completed by summer, 1957. Kiln and other facilities should increase production at the plant by more than 30%, according to the company.

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Brainard Steel names three Western reps

Three Pacific Coast organizations have been named to represent Brainard Steel Division of Sharon Steel Corp. in steel strapping sales and service. These include Wes Bender Sales Co. in San Gabriel, Calif., which will cover Los Angeles and 14 adjacent counties; Gerlinger Steel & Supply Co., Redding, Calif., to cover northern California; and Harmer Steel Products & Supply Co., Portland, Ore., to cover the state of Oregon.

Container Corp. begins folding carton plant

Renton, Wash., is the site of a folding carton plant which Container Corp. of America, Chicago, has started constructing. The plant should be completed in 1957.

It is being built on a 48-acre tract of land and will be of modern design and construction, with 80,000 sq. ft. of floor space for manufacturing and office areas. Six to 10 acres of the tract will be used for the building, with the rest held for possible future expansion.

WESTERNERS AT WORK . . .

Lamson Mobilift Corp.

K. C. Schmedike

. . . announces appointment of *Karl C. Schmedike* as manager of manufacturing. A native of Germany, where he studied engineering, Schmedicke was a tool and die maker in this country before working as an engineer with General Aniline. His 20 years of manufacturing experience include affiliation with Remington Rand, Rollway Bearing, and Lamson Corp. of Syracuse, which he joined in 1954.

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Colt Ventilation of America, Inc.

H. M. McLean

. . . newly-opened associate company of Colt Ventilation Ltd., Surbiton, England, has announced the election of *Hamilton M. McLean* as resident vice president and a corporation officer. Recently of Edinburgh, McLean was formerly area manager of Colt's Scotland operation and before that served 6½ years as a Royal Army Service Corps officer in the mechanical transport division. The American company at 4652 Hollywood Blvd., Los Angeles, initially will provide technical advisory service to California industrial firms.

Aero-Coupling Corp.

. . . has appointed *Pat Lynch* and *Lewis A. Greene* to new jobs within the organization. Lynch, an Aero-Coupling industrial sales engineer since 1951, will now be assistant sales manager, while Greene was named factory manager of the firm, which is a subsidiary of Aeroquip Corp., Jackson, Mich. Greene has been purchasing agent at Aeroquip, Inc., in Van Wert, Ohio.

LaSalle Steel Co.

. . . has announced three personnel changes in West Coast operations. *Kenneth Bock* was named sales manager for Southern California and the Pacific Northwest, with headquarters in Los Angeles. *William G. McKinley* was appointed Pacific Northwest sales representative, and *Fred E. Wissing*, who formerly covered the entire Western area, will now be LaSalle's representative in the San Francisco-Northern California area.

Joseph T. Ryerson & Son, Inc.

. . . has made two executive changes concerning *Theodore L. Kishbaugh* and *Wayne D. Dukette*. Kishbaugh, formerly manager of the Los Angeles steel service plant, will be assistant vice president for procurement, with headquarters in Chicago. Dukette, who joined the company in 1923, has been general manager of the San Francisco plant since 1947 and will become general manager in Los Angeles.

W. D. Dukette

T. L. Kishbaugh

Skil Corporation

. . . has announced appointment of *Paul Watts* of San Francisco as North Pacific regional industrial line sales manager. A Skil employee for 16 years, he has been San Francisco branch manager, national sales manager and sales vice president. He resigned the latter post to return as San Francisco branch manager last year.

Wayne Manufacturing Co.

. . . has made two personnel appointments recently. *Charles T. Link, Jr.*, was named chief engineer, and *Eugene G. Magill*, plant superintendent. The new engineer has been in charge of research and development for an Illinois street-sweeper firm for eight years, and before that worked for Racine Hydraulics and Equipment Co. Magill has been a Chrysler Corp. superintendent in Los Angeles for 10 years, and previously was with Parker Engineering.

Crown-Zellerbach Corp.

P. J. Metz

. . . has promoted *Peter J. Metz* to be Los Angeles plant superintendent of Western-Waxide Specialty Packing Division. Starting with the division as a packaging engineer in 1949, Metz' most recent post has been as a technical divisional superintendent of the San Leandro research and development laboratory, in charge of overall quality control of the firm's products.

Mercast Manufacturing Corp.

. . . has named *A. F. Anzlovar* as vice president and assistant general manager of the firm, an affiliate of Atlas Corp. Previously sales vice president, Anzlovar assisted in the organization of Mercast in Cleveland, after working with Kohlcast Industries there in its initial years.

Magnetic Research Corp.

. . . promoted *Donald C. Wagner* from production manager to plant manager. Both military and commercial production of MRC's line will be under his supervision and coordination. Before joining the firm at El Segundo, Wagner was with Lincoln Electronics, Preco, Inc., and Thermador Electrical Manufacturing.

Rockwell Manufacturing Company

. . . has two sales promotions in its Meter and Valve Division. *Robert B. Kitzmiller*, formerly gas products manager in Pittsburgh, Pa., has been named Los Angeles district sales manager, and *A. J. Komich* is now gas products manager, after serving as assistant in that post since early 1956.

Tapered Air Products Corp.

. . . has announced that *W. H. Toy* has been named general superintendent of the company. Before joining the firm he was with Rheem Manufacturing Co., Kaiser Industries, U. S. Spring and Bumper Co., Ford Motor and Consolidated Vultee Aircraft.

U. S. Steel Corp.

. . . has appointed *John E. Mattos* of its Columbia-Geneva Division to be sales manager in charge of manufacturing accounts in the southern sales district. Mattos, who has been in the steel business since 1937, will headquarter in Los Angeles, where he succeeds *Burton C. Smith*, recently named assistant vice president at San Francisco.

American Chain & Cable Co.

. . . has named a new Pacific Coast district manager, *S. E. Havens*. A veteran of 33 years with the company, he has been with the firm's Wright Hoist Division since 1929 and will now direct activities for that division in this district. Headquarters will be at 890 Tennessee St., San Francisco.

CLASSIFIED SECTION

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White Motor Co.

. . . has elected *Wilson D. "Pat" Patterson* Pacific Coast Regional vice-president, climaxing the start of his 35th year with the company. Manager of this region for 14 years, his initial job in 1922 was as a tool room boy, and four years later he was given the regional technical apprentice award affording him a year's training at the firm's Cleveland plant. After serving in production and service divisions, he transferred to the Portland sales staff and later managed Spokane and San Francisco sales staffs, being among the firm's 75 top-ranking national salesman.

Alcoa Aluminum Co.

. . . has selected *Donald H. Tilson* to succeed *C. S. Thayer* as manager of the company's Northwest operations. In his new capacity, he will assume overall responsibility for Alcoa's smelting and fabricating units at Vancouver and Wenatchee, Wash. Formerly manager of Alcoa's East St. Louis works, in 1953 he visited Yugoslavia as a World Bank aluminum consultant. Thayer, who retired after more than 43 years of Alcoa service, developed the Niagara type pot while with the firm's Niagara Falls works before coming to Vancouver in 1940.

Loven Chemical of California

. . . has added *Harry A. Fedderson* to its staff as technical director. He was previously associated with Catalin Corp. and Bakelite Division of Union Carbide and Carbon.

American Potash & Chemical Corp.

. . . has established a plant engineering section at its Los Angeles plant and named *Fred Torn* as head of the new department. A phase of the company's expansion and development program, the section will be responsible for design and improvement of plant equipment and facilities, as well as plant production economic studies.

B. F. Goodrich Company

. . . has named *Edward Bosworth* as Los Angeles plant engineer, replacing *Thomas J. Cook*. Joining the Goodrich engineering staff in 1929, Bosworth previously had assignments in the maintenance, installation and other engineering divisions. He came to Los Angeles in January as senior engineer of the company's West Coast tire plant.

Pacific Intermountain Express Co.

. . . has appointed *Willard A. Johnson* branch manager at its Yakima terminal. He has been administrative assistant to the vice president of operations at the firm's Oakland, Calif., headquarters. *Robert C. Perkins* has joined PIE as a sales representative in Seattle.

Shalco Engineering Corp.

. . . has appointed *Herbert von Wolff* as general sales manager and also elected him to the vice presidency of the firm. He will be in charge of the sales force and distributor network, conducting sales and service of shell molding and core equipment and muller and sand conveying equipment.

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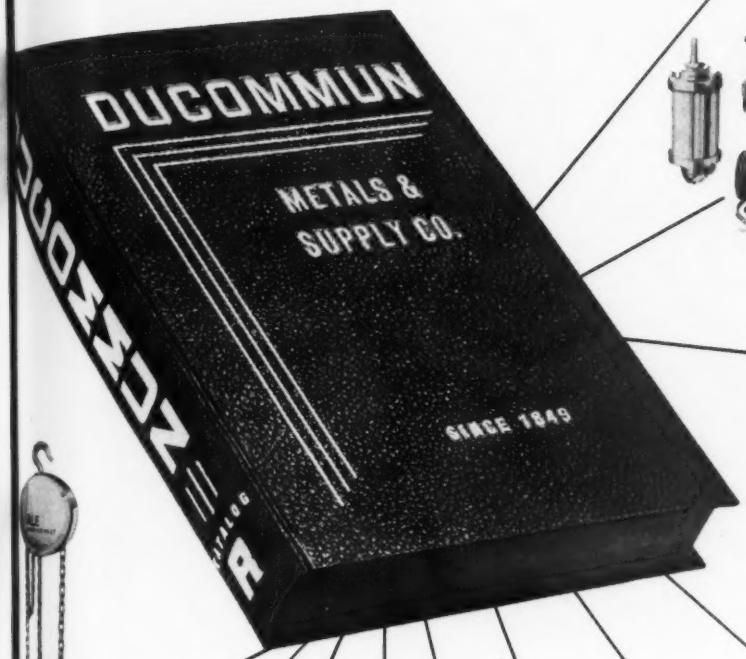

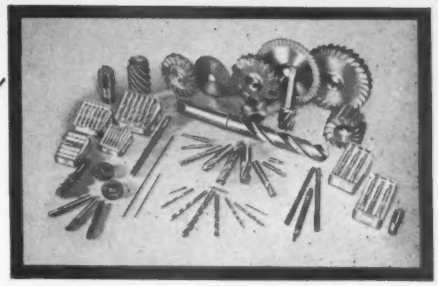

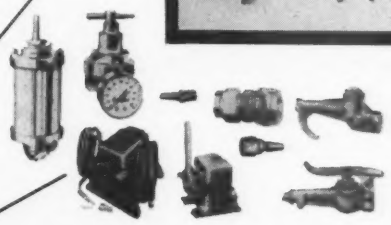

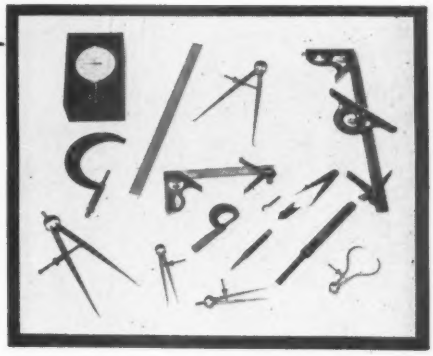

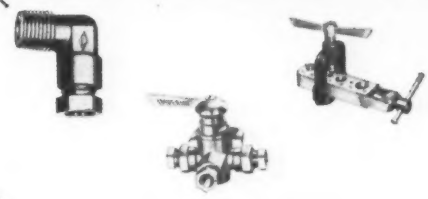

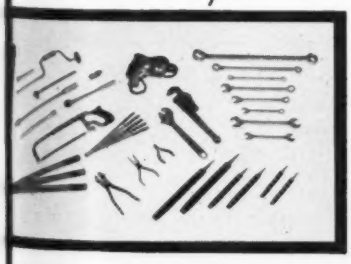

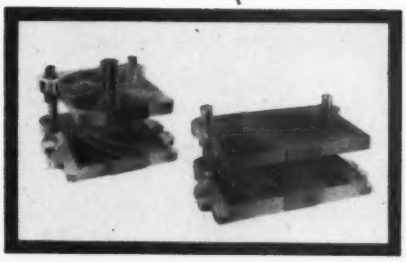

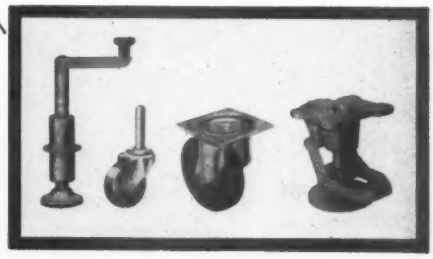

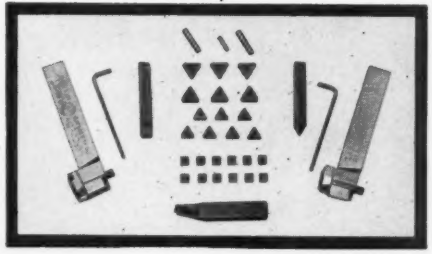

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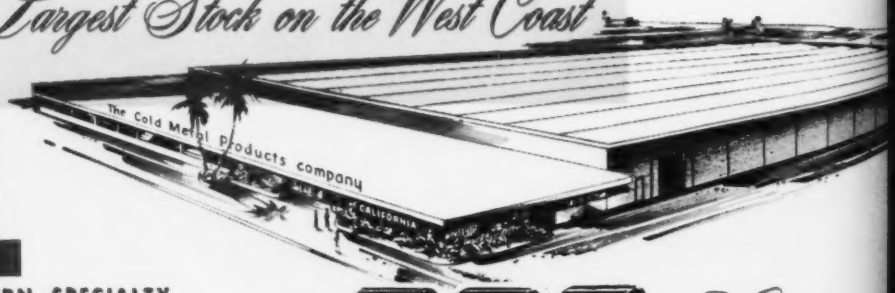

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